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ON HEALTH,  
WHAT PRESERVES,  
WHAT DESTROYS, AND WHAT  
RESTORES IT.

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BY D<sup>R</sup> HORNER.

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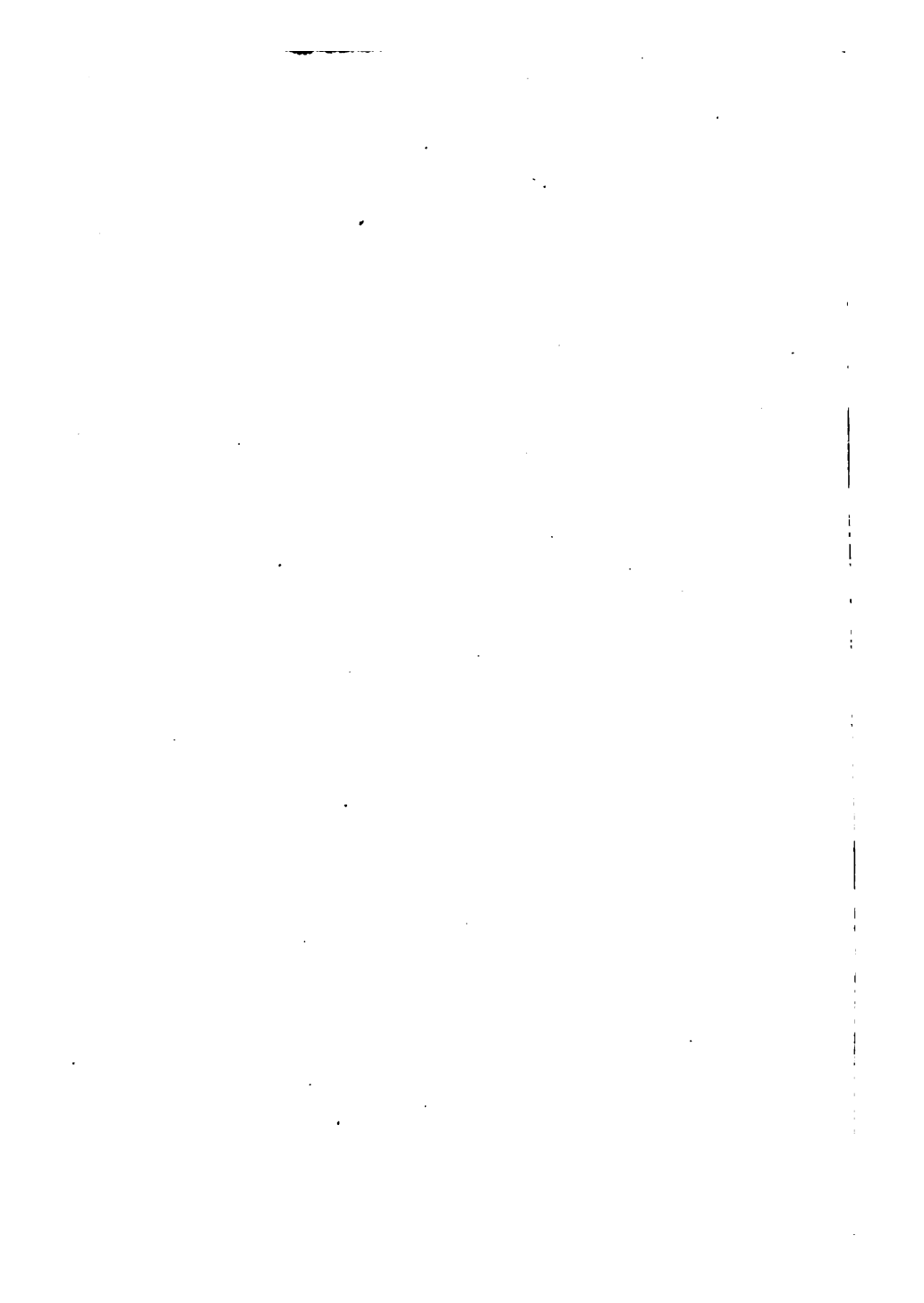
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ON THE





**ON HEALTH.**



BY THE SAME AUTHOR,

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# INSTRUCTION TO THE INVALID

ON THE

## NATURE OF THE WATER CURE,

IN CONNECTION WITH THE ANATOMY AND PHYSIOLOGY OF  
THE ORGANS OF DIGESTION AND NUTRITION.

---

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# ON HEALTH;

What Preserves, what Destroys, and what Restores it.

IN

TEN LETTERS TO A NON-MEDICAL FRIEND.

With Eight Engravings.

BY

JONAH HORNER, M.D. ED.,

LICENTIATE OF THE ROYAL COLLEGE OF SURGEONS, AND FELLOW OF THE ROYAL MEDICAL  
SOCIETY OF EDINBURGH. AUTHOR OF A TREATISE ON THE NATURE OF THE WATER CURE,  
ETC. ETC. ETC.

Quin corpus onustum  
Hesternis vitis animus quoque pregravat una,  
Atque aëgit humo divinæ particulam aures.

HOR.

SECOND EDITION.

LONDON:

WARD & CO., PATERNOSTER ROW.  
JAMES PACKER AND WILLIAM BRANSBY, THIRSK.

1858.

157. C. 130.



JOHN CHILDS AND SON, PRINTERS.

DEDICATION  
TO THE  
MINISTERS OF THE GOSPEL  
OF EVERY DENOMINATION.

---

MY DEAR SIRs,

This small volume appears to me so much adapted to your use and benefit, that I see a propriety in dedicating it to you. In connection with services so valuable and momentous as are rendered to mankind through your instrumentality, a correct knowledge of the fundamental principles of health, disease, and its treatment, becomes of great moment. This knowledge must bear directly on your usefulness, in enabling you to select the best means for the preservation of your health, and to avoid those things which tend to destroy it; and, on many occasions of indisposition, to adopt the suitable means of its restoration.

It will likewise enable you, on many occasions, to administer suitable advice to those under your spiritual care; as well as to keep them from error on such important matters. There is ever a peculiar propriety in your ability, to some extent at least, to advise for the welfare of the perishing body as well as for that of the deathless soul.

Moreover, I regard the knowledge of that portion of the anatomy and physiology of the human body which I have

introduced into these pages as also specially profitable to you, inasmuch as it has a powerful tendency to deepen the impression on the mind respecting the glorious attributes of God, and to fix it more firmly on the great truth of the Bible and Christianity.

I see an additional reason for this dedication in the strong conviction of my mind, that the most important results may frequently depend on a minister's knowledge of the physical constitution of man; and more particularly on such knowledge as I have endeavoured to communicate in these letters: I allude especially to the intimate connection and dependence of the state of the mind on that of the body. From ignorance of this great fact, or from neglect of it, very serious mistakes are liable to occur in the chamber of sickness and of death: there, or elsewhere, the changes of the bodily constitution are liable to be mistaken for those of the immortal soul.

I can think of no other class of non-medical readers to whom a correct understanding of the subjects treated of in these letters can be more useful and more important. With earnest wishes that my small and imperfect book may become the means of much good in your hands,

I remain,

Yours affectionately,

Thirsk, 22nd May, 1858.

J. HORNER.

## PREFACE

### TO THE FIRST EDITION.

THIS small book has been composed exclusively for non-medical readers. The Author's aim is to instruct them on the essential principles of health, disease, and its treatment. He hopes that the information contained in these few pages will prove effectual in protecting them from error of judgment respecting things which so greatly concern themselves, and which they ought to understand. It ought to shield them from the hollow pretensions of empiricism or quackery of all kinds in connection with the treatment of diseases. He confidently trusts that it will also guard them against that interested party spirit which confines itself to one class and kind of curative means, and so violently opposes all other modes of cure, however excellent, and based on the sure principles of physiology. He need not now particularize further respecting these, for he can safely leave the intelligent reader to decide for himself, after his careful perusal of what is here advanced on the subject.

The Author is anxious for an extensive circulation of his little volume; and for that purpose he has determined on the lowest possible price for its sale. He has also chosen the epistolary style of composition, as the best adapted and most agreeable

medium for communicating knowledge of these subjects to the general reader. He has avoided the use of technical terms as much as possible, and in the few instances where they necessarily appear they are explained; so that no one can complain that the language is unintelligible. In order to impress the more essential principles and important particulars on the reader's mind, he has not hesitated to use repetitions, and to make frequent reference to past statements. This may possibly be thought a fault of composition; if so, it has been purposely committed for the benefit of his readers.

In the prosecution of his plan of instruction, the Author has proceeded on the impression that some preparatory explanation of the functions of the body, in direct connection with the subject, becomes really necessary when writing for non-medical readers. The reader is requested to carefully peruse and to consider well the contents of the first of these three letters; for it will greatly aid him to correctly understand the other two. (*The contents of the first letter of the first Edition now occupy the first five letters of the second Edition.*)

But little difficulty can be experienced by any one of moderate education in understanding this book. The Author has aimed especially at making it plain and intelligible. The woodcuts have been introduced still more to facilitate the reader's understanding of the organs and functions of the body, and to keep the impression on his mind more vivid and more lasting concerning them.

## PREFACE TO THE SECOND EDITION.

THE subject-matter of this little volume has undergone considerable improvement in its arrangement. That which was contained in three letters has been subdivided so as to now form ten. To each letter has been prefixed a short head of its principal contents, in addition to the more particular ones in the general Table of Contents at the beginning of the book. This arrangement must make the volume more adapted for the easy and profitable perusal of the non-medical reader.

Many pages of the matter contained in the first edition have been removed, in order to make room for other particulars which the author deems more important to be known, as well as more interesting to the general reader.

Another useful Engraving has been added, to enable the reader to fully comprehend a fundamental law of the animal economy.

Again the Author confidently offers his little work to the class of readers for whose benefit it was originally designed. He does this under the honest conviction that their careful study of its contents must increase their usefulness, and enlarge the sphere of their influence for the good of their fellow creatures.

Thirsk, 22nd May, 1858.



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# ON HEALTH:

WHAT PRESERVES, WHAT DESTROYS, AND  
WHAT RESTORES IT.

---

## LETTER I.

ORGANIC AND INORGANIC MATTER—THEIR DIFFERENT PROPERTIES  
AND LAWS—ON ORGANS AND THEIR FUNCTIONS—VEGETABLE AND  
ANIMAL LIFE, AND PHYSICAL AGENTS—ORGANIC VITALITY AND  
VITAL HEAT, &c., &c.

MY DEAR SIR,

YOUR late letters to me contain inquiries which are of a very interesting nature; and a correct reply to them will form the basis of most valuable knowledge, which cannot fail to be of the greatest service in your future journey through life. I shall endeavour to fully satisfy your mind on the fundamental principles of that knowledge. However, I deem it quite necessary to put you, a non-medical reader, in possession of certain preparatory information concerning those organs and functions of the human body which are principally concerned in health, disease, and its treatment.

I have firstly to state to you that there are two distinct kinds of matter; or rather, two distinct modes of its existence; namely, organic and inorganic. These are always under the operation of distinct laws or influences. The latter, or inorganic matter, is under the operation of chemical laws, and is constantly undergoing a change of form and constitution; and this change takes place according to the comparative power of certain external and internal influences which are of a chemical nature.

The language of your statements and questions in your first



letter to me, concerning the decay and annihilation of matter, is not strictly correct. There is no such thing as the *entire destruction of old* and the *generation of entirely new matter*. The world has in it precisely the same amount of matter now as it had at its creation. It is not a destruction or decay in any other sense than in a *change of form, or mode of existence*,—a change of the constitutional elements of matter, by which they enter into other and various combinations.

Our great Shakspeare, who possessed such variety and depth of knowledge, made allusion to this law of matter in the often-quoted passage from *Hamlet*—"To what base uses we may return, Horatio! why may not imagination trace the noble dust of Alexander, till he find it stopping a bung-hole? \* \* \* \* as thus; Alexander died, Alexander was buried, Alexander returneth to dust; the dust is earth; of earth we make loam, and why of that loam whereto he was converted, might they not stop a beer-barrel?" &c., &c. And you see in this law a literal fulfilment of the punitive decree of the Divine Creator, when addressing Adam, the fallen father of our race,—"for dust thou art, and unto dust shalt thou return."

*Organic* bodies differ from those which are *inorganic* in possessing the distinguishing principle of life—the *vital principle*. This keeps them under the influence of laws peculiar to themselves, and protects them from that of the purely chemical laws of inorganic matter. As soon as their organic life ceases—that is, when they become dead—they also become subject to these chemical laws, and commence to undergo change, as is constantly seen in the decay or putrefaction of vegetable and animal bodies after death.

Again, organic bodies are subdivided into animal and vegetable. They are termed *organic* because they possess certain parts, instruments, or *organs*, by which they perform certain actions peculiar to each, and these actions are termed *functions*. For instance, the leaf of a plant is an *organ* or instrument by which the sap is changed into the proper juice of the plant or tree. The action by which it is so changed is termed respiration, and it is the *function* of the leaf. Again, the root, by its minute fibrils,

absorbs nutriment from the soil in which it grows, and is the *organ* of the plant which performs the *function* of absorption.

In man, the stomach is an *organ* for the *function* of digestion ; the liver is an organ, and its function is the secretion, separation, or formation of bile from the venous blood, which flows into it for the purpose. The brain is the organ of the mind. The skin, too, is a very important organ, which performs the functions of secretion, excretion, and absorption, on which the health of the human system so greatly depends. Hence the great efficacy of the water-treatment, which bears so much upon these functions. The human body consists of various organs. *Inorganic* matter is so called because it is without organs and functions, and is only subject to the operation of chemical laws.

An animal is distinguished from a vegetable body by its properties or powers of sensation and voluntary motion, which do not belong to the latter. It is capable of feelings, and of moving from place to place, according to its will.

The chief difference in the nature and qualities of both vegetable and animal matters consists in the relative proportions they contain of the four elementary substances, called *oxygen*, *hydrogen*, *nitrogen*, and *carbon*. Some matters, which differ greatly from each other in their properties, contain the same component elements in proportions but slightly different from each other. I may mention to you, as familiar instances, those of *sugar*, *gum*, *starch*, and *fat*. Again, and more remarkable, the *diamond* and *charcoal*, or *carbon*, are identical in their constituent elements, although so different from each other in their external properties.

I wish you to ever keep in mind that two distinct kinds of actions are performed by organized bodies. These are properly termed *organic* and *animal* actions ; the former kind are performed by all living or organized bodies, both vegetable and animal ; the latter are performed by animals only.

The actions of organic life are those by which the existence of the living body is continued, and the propagation of the species is effected. And, remember, that the actions of animal life are

those by which the living being has perception of external objects, and power of voluntary motion from place to place.

You will also keep in mind that the actions of organic life are those of nutrition, respiration, circulation, absorption, secretion, excretion, and reproduction. All these organic processes are necessary for the continuance of life, excepting the last one, which is for the propagation of the species.

Organic and animal life are maintained by certain processes which are performed by certain organs. These processes are termed their functions, as already stated. Through the functions of organic life both vegetable and animal bodies are formed and maintained in their four component primary elements, termed *oxygen*, *hydrogen*, *nitrogen* or *azote*, and *carbon*. Vegetables derive these from the soil, and require a due supply of *air* and *water*, with *heat*, *electricity*, and *light*. These are called *physical agents*, and are as necessary for animal as for vegetable life. The four component primary elements exist in different proportions in vegetable and animal bodies. Carbon abounds in vegetable, and nitrogen or azote in animal matter: they are, therefore, termed respectively their fundamental or distinguishing elements.

Of these *physical agents*, I call your special attention to that of *heat*; because of certain interesting particulars which are not commonly known nor considered; but which are demonstrative of the great law of all living beings—that they possess the power of resisting the influence of external heat and cold, within a certain range; and that a certain degree of heat is indispensably necessary for *organic vitality*: this is called *vital heat*.

In winter all living vegetables are warmer than the air surrounding them; and in summer they are colder. This has been proved by repeated experiments, and is an established fact. You see it illustrated by the familiar circumstances, that snow which has fallen on plants and on grass sooner thaws than that which is on the bare ground: again,—that any dead branches in a tree will retain the snow much longer than will the living ones. And the tender plants of our climate can resist the degree of cold by which adjoining large bodies of water are frozen.

But this *vital power* to resist external temperature is more re-

markable in other climates of extreme heat and cold. In Norway, Sweden, and North America, where the degree of cold in winter is usually far below the freezing point, and as much as  $40^{\circ}$  or  $50^{\circ}$  below zero, the fir-tree and the birch, with others of the country, retain their *vital power* and *vital heat*, and remain unfrozen. Remember, that when a plant or tree is once frozen it is also killed; as is the case with any part of the animal body. Again, in tropical climates and during the greatest heat of summer the shrubs and trees are frequently surrounded by a heat of  $110^{\circ}$  or  $120^{\circ}$ , whilst they resist its influence and remain at a much lower temperature.

I shall refer to this function for maintaining a fixed degree of *vital heat* in the human body when we come to the proper place for it. Here, however, I make a few brief remarks concerning it in animal beings which stand lower in the scale of organization. Indeed, the lower they stand in this respect the nearer they approach to vegetables in their comparative *inability* to resist the changes of external temperature: but, during life, it is never so low in winter as the medium they live in. In fishes, and in worms and insects, it is two or three degrees higher. These, which are colder than animals of a higher organization, are less capable of resisting change of temperature, whether it be from heat or from cold. Thus animal beings are divided by naturalists into the two well-known classes of *cold and warm blooded animals*. The *animal* or *vital heat* of the former admits of greater variation, according to the temperature of their surrounding medium; whilst that of the *warm-blooded* remains nearly the same, whatever the change may be.

You must bear in mind that the vital heat of animals differs in its degree according to their particular class. For instance, that of birds is the highest, and is always at  $103^{\circ}$  or  $104^{\circ}$ : whilst that of the mammiferous or pap-bearing class of animals is  $100^{\circ}$  or  $101^{\circ}$ . That of man is  $98^{\circ}$  or  $99^{\circ}$ .

It has long been an impression on my mind, that in connection with the high temperature of the blood of birds, and its highly *oxygenized* quality, they must enjoy a degree of physical or animal happiness beyond that of any other class of animals. Yes,

I have often thought that these winged tribes of the creation manifest strong signs of their enjoyment of life. Often have I looked with congratulatory feelings on the morning lark whilst she mounted with cheering song to the clouds. Often, also, have I noticed the sallies and gyrations of the hawk and the crow: and when I have listened to the melodious song of the thrush, the blackbird, and the other songster race, I could not doubt of their great enjoyment of existence; and I thought, with Archdeacon Paley, of the benignity of the Creator.

Remember, that this *vital heat* is ever indispensably requisite to, and in union with, *organic vitality*. This is seen in many ways. It is seen in the seeds of plants and vegetables of all kinds. It is particularly evident at the time of their germination or sprouting. You know that the common process of *malt-ing* is but an artificial mode of bringing this about; and that a high degree of heat is produced by it, in having the barley in heaps.

This union of *vital heat* and *organic vitality* in the seeds of plants and flowers has frequently preserved them in the earth for their future vegetation and growth in their natural beauty after the lapse of thousands of years. Hence, too, the well-known fact, that wherever the soil of this earth has been freshly dug up there have soon appeared the various flowers and plants which had adorned the ground in past ages. This has been much seen in the gigantic operations of railway-making, and many very rare species of flowers and plants have been in this way restored.

I must also notice to you the *vital heat* and *organic vitality* existing in the egg. These together constitute its capability for the future production of the majestic eagle, or of the tiny wren—of the sable raven which tours in the clouds, or of the nightingale, the lovely songster of the grove. There is a particular point in connection with the vital heat and organic vitality of the egg, which deserves your special attention, and with which many persons are unacquainted. Indeed, it is kept as a kind of secret amongst the breeders of game-cocks, and the dealers in fancy poultry, who wish to monopolize their valuable breeds

of these various fowls. This kind of secret with them is the fact well known to scientific persons, that at the thick or broad end of every living egg there is the central place of its vitality, which you can at once discover with the tip of your tongue. In applying your tongue to the broad end of the egg you will at once feel a small warm spot: this is the central point of the egg's vitality or *organic life*, and where are placed the rudiments of the future chick. It is attached to the yolk, which becomes its store of food during its confinement within the shell. Well, the aforesaid breeders of game-cocks and of fancy poultry usually destroy the organic life at this central warm spot, before they allow the eggs of their valuable fowls to go out of their hands. In this way they effectually prevent the possibility of any one raising chickens from them. Sometimes they do this by exposing the vital part to boiling water; sometimes by pricking it with a needle. After such operations the egg is deprived of life, and is consequently of less value as food; for it is then liable to soon become bad or rotten. Therefore, before you order your breakfast egg to be boiled you can at once ascertain its quality by the simple method I have just mentioned.

You must mark one distinguishing circumstance between vegetables and animals, namely, that the former by their digestive functions change inorganic into their own organic matter: whereas, animals convert matter already made organic into their own proper substance. For the support of animal life, vegetable or animal matter, or both, must be supplied.

You perceive, then, that vegetable life stands in the relation of purveyor or provider to that of animals. It elaborates and provides its component substance, to be their food, from inorganic matter, by combining its component elements into suitable compounds. The vegetable purveys for the animal life, in changing inorganic into organic matter. You readily understand that this relates directly to herbivorous or herb-eating animals, and indirectly to the carnivorous or flesh-eating ones. The more simple life of vegetables is thus subservient to the purpose of supply to animal life.

Thus you perceive, that the inorganic mother-earth supports

her innumerable offspring of organized beings, the teeming myriads of vegetable and animal existence. She supplies nutriment directly in its elementary components to vegetables; and through these to herbivorous animals. Man, who is at the top of the scale of animal beings, and whose food is usually composed of both vegetable and animal matter, is thus provided with food previously prepared and best adapted to his more complicated system and higher condition. This provision, you see, is made through the medium of vegetable and lower animal life. Thus the necessary compound nature of his food is secured, and his every bodily want, in this respect, is supplied.

How grand in their simplicity and perfection are the works of the adorable Creator! How evidently designed for the benefit of man, and how calculated to fill his heart with thankfulness for such goodness and wisdom exercised in his behalf!

You must keep in mind that the basis of vegetable matter is solid, namely, carbon, whilst that of animal matter is aeriform or gaseous, and named nitrogen, or azote. Hence the more rapid decomposition of animal bodies after death.

The entire and ultimate elements of the human body are both gaseous and solid. Of the former are *nitrogen, oxygen, and hydrogen*; of the latter, or solid elements, are *carbon, sulphur, phosphorus, calcium, sodium, potassium, magnesium, and iron*. Remember that these are termed *ultimate and elementary*, because they cannot be decomposed into component parts of more simple substances. These elementary substances, however, unite with each other in various proportions, to form compound substances. For instance, a certain proportion of nitrogen or azote, uniting with a certain proportion of hydrogen, oxygen, and carbon, constitute a compound substance of certain properties. Other proportions of the said elementary substances, uniting with each other, form other compound substances of different properties.

You must keep in mind that the compounds which are formed by a combination of the primary elements, as just stated, are termed *proximate principles*. Now, these proximate principles are distinct forms of animal matter, which enter

into the composition of the human body; the principal ones are *albumen, fibrine, gelatine, fat, mucus, urea, resin, pickromel, sugar,* and *osmazome*.

We cannot now enter into a particular account of these proximate principles; but I just remark again, that some of them differ but slightly in their component elements, however different in their external properties.

I mention here, for your information, that the ultimate or primary structure of organic bodies, vegetable and animal,—its mode of generation or formation, as examined through microscopes of very great power, is ascertained to take place in *cells*; and the increase takes place by *cell-germs* within them. On this microscopic discovery is established a theory of much interest and beauty, explanatory of different particulars of animal and vegetable organization. I cannot, however, find space for a further description of it. I just state it as a subject for your reflection, and which, like many others, is adapted to lead the mind to contemplate the wisdom, power, and goodness of the infinite Creator.

I wish you, dear Sir, especially to keep in mind that the component matter of the human body, and of all animal bodies, is incessantly undergoing a renewal. You already know that oxygen is the chief chemical agent in the process. You must be familiar with the properties of this very powerful elementary substance from the frequent reference made to it in my published treatise "*On the Nature of the Water Cure*;" and because of the important part it plays in water-treatment. You know that oxygen has the special property of combining with other elements to form compounds according to the kind of combination. It combines with carbon to form carbonic acid; with hydrogen, to form water; with nitrogen or azote, to form atmospheric air. I may just observe here that the word *oxygen* is of Greek origin, and means *to generate or make acids*, because it enters into the composition of all acids, and, indeed, generates them all, with very small exception.

Let me here inform you that the atmospheric air which we breathe is composed of two ingredients, oxygen and nitrogen



or azote; by volume, about 20 parts of oxygen and 80 of azote. The oxygen is essential to both vegetable and animal life, and is the great supporter of combustion or fire. Could you remove all the diluting and counteracting influence of the azote from the atmosphere, the whole earth would be immediately burnt up by the power of the oxygen. Nitrogen or azote has the opposite properties to those of oxygen; hence its name of *azote*, which means in Greek—*without or against life*. The atmospheric air surrounds our earth; and it extends to about 42 miles above it. It possesses the properties of compressibility and weight. It is heaviest nearest the surface of the earth, and weighs or bears upon every square inch of it to the extent of 15 lbs. It is condensed by cold; and rarified, or made thinner and lighter, by heat. On this principle are our Thermometers constructed. You must understand, that besides the two essential ingredients, oxygen and nitrogen, the atmospheric air has always diffused in it a small quantity of carbonic acid gas and watery vapour.

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## LETTER II.

CHANGE OF TISSUE—DIFFERENT STRUCTURES OF THE HUMAN BODY  
—ORGANS OF THE NERVOUS SYSTEMS—CIRCLE OF INFLUENCES,  
&c. &c.

MY DEAR SIR,

THE great vital process termed the *change of tissue*, which is *nutrition*, and the constant renewal of the whole material of the animal frame, as already alluded to, cannot be too much before your mind. Therefore I shall repeatedly refer to it. Here let me make it plain to you in its general character. When I come to describe to you the mode of the generation of *animal heat*, I shall enter more into particulars of this process by which that heat also is mainly procured. The oxygen in the atmospheric air inhaled by the lungs plays the chief

part in it. You know that an ordinary man consumes, on an average, about 2 lbs of solid food every day. Let me tell you that under ordinary circumstances he also takes into his body daily about the same weight of oxygen. On a correct calculation we arrive at the conclusion that in one year he will thus take into his system about 1460 lbs of solid matter, in food and oxygen. Yet he will remain of the same weight of body at the end of the year as at the beginning of it. We know that daily a considerable amount of refuse matter is given off from our bodies by the bowels, the kidneys, the lungs, and the skin.

Plainly you must perceive that two opposing processes of *removal* and *addition*, or *waste* and *repair*, are continually going on within us. These have their chief place of operation in the extreme or most minute structures of the body; and they constitute its *change of tissue*, its *nutrition*, and its waste and repair—the taking down and building up of its material.

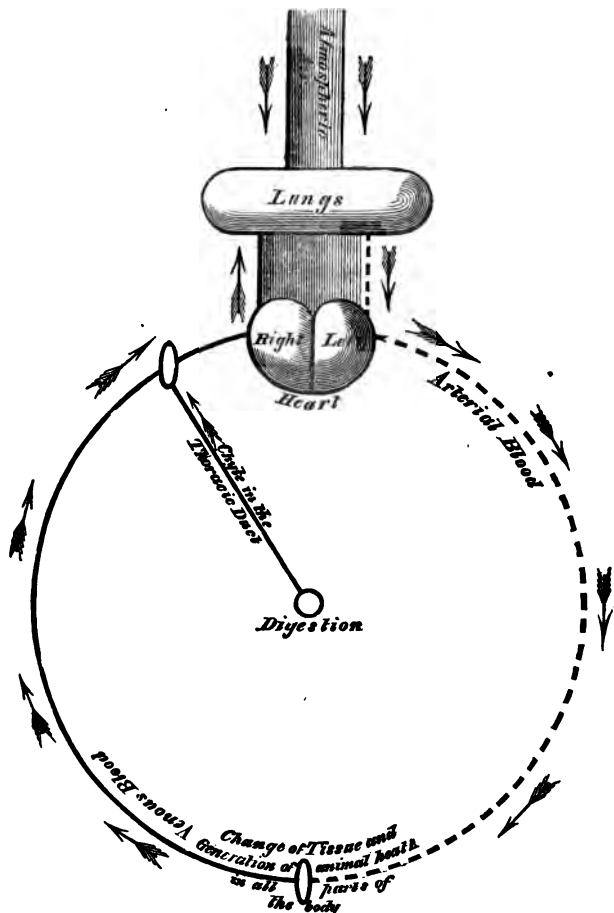
I am explaining things in general terms to you, without noticing particulars. I must keep before you, however, that the oxygen taken into the body by inspiration of the lungs, and carried by the blood-vessels called *arteries* to the most minute structures, unites with the elements of waste matter there, and then in its combined state it returns by the other blood-vessels called *veins*, and is given off again by the expiration of the lungs.

The place of the waste matter carried off, in union with oxygen, is immediately supplied by fresh matter or nutriment, which is furnished from the food of the digestive organs. It is first carried from these organs to the lungs, to be fully assimilated and there united with oxygen to form nutritious blood, which is conveyed by the arteries to all the extreme structures where the process of *change* or *renewal* is going on. Thus, you see that this process in its entire apparatus is plainly, from beginning to end, in a circle.

I give a rough diagram below, which only represents the relation in which the organs concerned stand to each other in

the process of *nutrition* or *change of tissue*—and as you see at once, it is in total disregard of everything else—

Fig. I.



You see in this diagram what I have just described in words, and scarcely needing further explanation. From the centre of the circle is seen the passage of the chyle, or

nutriment of food, in a large duct called the *Thoracic Duct*, from the digestive organs to a certain part of the large trunk of a vein near the heart, which trunk it enters, but, in truth, it really enters at the place of juncture of adjoining veins, which go to form this, the largest vein of the body; and the chyle or nutriment is thus commingled with the dark stream of venous blood containing waste matters of the body, and soon with it to enter the right side of the heart, and then the lungs. After exposure to atmospheric air inhaled, it is returned, as you see by the dotted line, in its new character of arterial and nutritious blood, from the lungs to the left side of the heart. Next it is propelled into the largest artery of the body, called the *Aorta*, and is distributed throughout the entire substance of the body, and to every minute and extreme structure, for *nutrition*, or *change of tissue*. The arrows mark the direction in which the arterial and the venous blood flow.—And you see that it is in a circle, in a certain sense, as I said before, but not in a literal sense, for the *change of tissue* must take place in the substance of the heart and lungs themselves, as well as in all other parts of the animal frame.

You must ever remember that *veins* are blood-vessels which carry very dark red and impure blood *from all parts of the body to the heart and lungs*; whilst *arteries* are blood-vessels which carry bright red, or scarlet coloured, and nutritious, vitalized blood *from the lungs and heart to all parts of the body*.

You can readily understand that the refuse and waste matters of the body, which do not pass off by the lungs, are removed, according to their nature, by their suitable *outlets* of the bowels, the kidneys, and the skin.

The *change of tissue*, *nutrition*, or the renewal of the various structures of the human body, becomes the chief source of health and disease, according to its right or wrong performance. You must consider, however, that it is not the *primary* source, but *secondary* to the function of digestion and assimilation of food into blood; and that this, again, is in *secondary* relation to nervous power. What constitutes this nervous power is not known; only it seems to be closely associated, if not identical, with electricity.

I must now tell you of the principal structures of the human body, to prepare you for further instruction. These are the *muscular*, the *cellular*, the *osseous* or *bony*, and the *nervous*.

The muscles of the body are what is commonly called the flesh; and many simple, untaught, and unthinking people suppose that this flesh is a confused mass which surrounds and adheres to the bones; and they are without any definite idea of its use. You know, that this flesh is a regularly arranged system of separate parts or muscles, which are of various sizes and forms; that each muscle is a bundle of fleshy fibres, and is an organ of motion; and has an origin and an insertion. When the body is divested of its covering or skin, you see these masses or bundles of flesh, called muscles, running in different directions. You see, also, that they are of various shapes: some are narrow and thick, others are broad and thin: some are more round in appearance: some are uniform in their size; and others are large in the middle, and taper towards their extremities: some spread out in the form of a fan: some are long, and others are short. They differ, also, in their course or direction: some run parallel with the bones, whilst others go in an oblique or transverse direction. These various particulars of these bundles of flesh, called muscles, adapt them for their various uses in the motions of the different parts of the body.

Each muscle is surrounded by its own separate sheath of a gauze-like cellular tissue; and if you carefully open this sheath, you will find that the substance of the muscle is composed of smaller bundles of parallel fibres; and that each bundle of fibres is also enclosed in a fine sheath of cellular tissue. There is much interesting anatomy regarding muscles; but I must be brief. I have just to state, that every motion of the human body is produced through the instrumentality of muscles. They constitute its principal bulk, symmetry, and comeliness. Remember, that they are developed in proportion to their exercise. Hence, you may see them displayed in their fulness and beauty in the lower limbs of dancers; in the arms of blacksmiths, quarry-men, and navvies: and you may see them in their fullest proportionate and general development in the trained pugilist.

I here present to you a view of the muscles of the trunk of the body, when the skin has been carefully removed.

The cellular tissue forms a kind of minute net-like framework of the whole body ; and it enters so minutely and extensively into every part, that if all the other matters were entirely removed, this cellular tissue would perfectly preserve not only the outline, but the exact dimensions of every organ and part. Every bone partakes largely of this cellular tissue in a spongy or network arrangement ; the interstices, or vacant places, being filled with the component matter of bone.

Fig. II.



The trunk divested of the skin, showing the muscles, *a*, *b*, *c*, &c.

This brings me to the very brief notice I am to take of the structure of bones. Without further particulars, I have just to

inform you that they consist of two distinct ingredients: one is *gelatine*, which has been already alluded to; and it is an animal substance; the other is the hard earthy matter, called *phosphate of lime*, which gives the quality of hardness to bones. It is soluble in diluted acids: therefore, if you place one of the long bones of the body, say one of the arm bones, in such a liquid of diluted sulphuric, muriatic, or nitric acid, it will lose its *phosphate of lime*, and the *gelatine* only will remain: but the dimensions and shape of the bone will be retained. With the phosphate of lime, it will also lose its brittleness and hardness; so that you may then take the same long bone and tie it in a knot, as is represented in the annexed figure.

Fig. III.



Membranous portion of bone; the osseous portion being so completely removed, that the bone is capable of being tied in a knot.

There is a certain diseased state of the human constitution called *rickets*—technically, *mollities ossium*, or softening of the bones—in which the limbs may be twisted and bended without harm. I shall bring before you such a case in a future letter.

There is also a diseased state of an opposite nature to this, wherein there is a deficiency of gelatine in the structure of the bones, and they consequently become brittle. If you burn a bone in the fire, it will destroy the gelatine, and leave the phosphate of lime. The bone will remain of the same dimensions or size, but it will have become very brittle and very light in weight, from the loss of its gelatine.

I now tell you of the structure of nerves. They are firm white cords, which are directly or indirectly continued from the substance of the brain, spinal marrow, and the other centres or sources of nervous power. Yet, instances have been met with where the brain, and even the spinal marrow, have been found nearly obliterated in the foetus, or unborn child, and yet the nerves retained their usual appearance.

The nerves are distributed throughout the body, and extend to every part which possesses that sensibility which gives rise to perception, and to every part having an associated action with other parts.

Nerves differ in form, and are more or less of a flattened or oval form; but this is mainly owing to their place and relation, and not to any peculiarity of function. They vary in firmness and density; but this, like their form, depends on their situation; for where they are protected they are more soft, and where they are exposed they have a harder covering.

The matter of nerves is something peculiar, and you will do well to remember that it is, in health, of an opaque white colour; that it is a soft, pulpy matter, being betwixt fluid and solid. By want of use, this matter is either not secreted in due proportion, or it changes its appearance; for the nerves then acquire a degree of transparency.

The nerves have three coats or coverings, which are thought to be continuous with those of the brain. They are composed of sheaths, or most minute tubes, filled with the proper nervous matter, and that matter is a real secretion, and like the other solids and fluids of the body, it is constantly undergoing renewal. This is a very important point, and ought to be re-



membered by you ; it will be again brought before you in connection with the great chemico-vital process of the renewal of tissue, in its association with the origin of disease.

Nerves are of various thickness. At their origin they are thickest ; and, like arterial blood-vessels, they become more and more minute in their ramifications, until they become too small to be seen with the naked eye. Their structure includes the most minute blood-vessels and absorbents necessary for the renewal of their component matter.

Such is the outline of the anatomy of nervous structure. There are many more minute particulars which anatomists describe as the result of their microscopic examination ; but I have here mentioned what it most concerns you to understand, and which you must remember.

Whatever may be the real nature of nervous power, the nerves are its conductors from its various sources, which are called *nervous centres* or *ganglia* : these are central masses of a special structure, by which the *nervous power* is generated. They are the *brain*, the *spinal cord*, or *spinal marrow*, and the numerous *minor nervous centres* or *ganglia*, which are named according to their situation in the body, and the organs they supply.

Could I convey to you, dear Sir, a perfect knowledge of the nervous systems of the human body, could I enable you to view them in the minute anatomy and physiology of their nervous centres and of their nerves, could you understand all these in their different uses, connections, and dependences, as a whole, you could not fail devoutly to acknowledge that they are excellent in design and perfect in their adaptation. They are well declared, by those who have knowledge of them, to constitute the Divine masterpiece of animal mechanism. But I must refer you to larger works for a minute account of them ; I can only give a general outline in this brief treatise.

Concerning these centres or sources of nervous power, let me, firstly, tell you of the *cerebrum* or *brain*. It is divided into two halves or hemispheres, and is the organ of the reasoning

faculties of man, and gives out the mandates by which the *will* calls the muscles into action.

At the base of the brain are placed the *ganglia of the special senses*, which become the instruments of *instinctive actions* in animals. In man they are the instruments of emotions, feelings, appetites, and passions, which are under the government of his reasoning faculties for their just regulation. Too often, alas! do they govern instead of being governed! Thus it is that intellectual man is so frequently found degraded in vice and misery, from which the lower animals are protected by their unerring instinct!

I must just mention to you that the *cerebellum* or *little brain*, which is placed below and behind the *cerebrum*, is the source or ganglion of animal power, and has also to do in the correct regulation of muscular action.

In strict anatomy and physiology, the *spinal cord* or *spinal marrow* must be considered as belonging more to the *organic* than to the *animal nervous system*, although it is frequently classed with the latter by medical authors, because of its being the medium by which *volition* and *sensation* are sent from the brain for voluntary muscular action, and other purposes of animal life. It is, in fact, a medium of connection between the two systems of nerves. It is not what it was formerly supposed to be, a mere bundle of nerves continued from the brain. It is a distinct apparatus for supplying nervous power for muscular action, whether of *voluntary* or of *involuntary* kind. The former, or voluntary muscular action, in connection with sensation and volition, connects it with the *animal system of nerves*; the latter connects it with the *organic system*.

The *spinal cord* is the *special ganglion* or *nervous centre* of the *reflex actions*, or *excito-motory movements*. Of this important function I have now briefly to inform you. Its system of nerves arise from the *spinal cord*, and proceed thence to all the organs and parts which are under its influence. Please to mark attentively, that by one part of their constituent fibres the reflex nerves communicate the impression of the exciting cause to the spinal cord, and by the other part of their fibres

they return or *reflect* the active or motory power from the spinal cord to the muscles it excites to action.

These *reflex actions* consist in muscular movements, which are caused by external impressions without any necessary exercise of the will, without consciousness, and without sensation, *in the healthy state*.

I will state the principal parts and movements of the human body which are under the rule of the *reflex function*. This, indeed, will give you the best understanding of its nature. Firstly, then, I specify all the hollow organs, as, the stomach and bowels, in the propulsion of the food downwards; the bowels and the bladder, in the expulsion of their contents; the heart, in its work of the circulation of the blood; the lungs, in respiration. And we have *reflex action* of the gullet, in swallowing; of the eyelids, in winking. Further, the *inlets* by which food and air enter the body, and the *outlets* by which the excretions are expelled, are partly subject to *reflex action*; and in some measure, also, to that of the will.

But you must recollect, that this reflex action of organs and muscles concerned is always produced by special agents or excitants; and the motory power is always *reflected* or returned from the spinal cord. There are also modifications of these exciting causes, which must necessarily modify *reflex action*; and this may take place under different degrees of volition. For instance, by contact of the morsel of food with the *fauces*, or top of the gullet, we cause deglutition or swallowing, which is partly a voluntary act; whilst the contact of the blood in the heart causes its contraction without our consciousness.

When the exciting causes are abnormal or morbid in their nature, they give rise to irregular or *convulsive action*, which is always in connection, directly or indirectly, with the *spinal cord*. Worms, or other irritating causes in the intestines, especially in children, give rise to *convulsions*; also irritation of the gums in *dentition* or *teething*; and all similar causes act through the reflex nerves on the spinal cord, and not on the brain, as is often supposed. I may also allude to the action of certain poisons which are absorbed into the blood, especially *strychnine*.

In causing most violent convulsions this poison acts through the blood on the spinal cord, which, as already stated, is the source of nervous power for muscular action of all kinds. The poison of hydrophobia acts, also, through the blood.

From certain *ganglia* or *nervous centres*, placed on the anterior surface of the vertebral or spinal column, are sent off the *sympathetic* or *organic nerves*. These have free communication with the spinal nerves, and with other *ganglia* that lie amidst the abdominal organs, as well as with others which are placed at the base of the heart. And in the head we find also many other scattered ones belonging to the same system, and communicating with the nerves of the brain, and connected with other *ganglia* in the neck. You must mark attentively, that the nerves proceeding from these nervous centres are not distributed to the skin and muscles, like those of the reflex function already described to you, but to the organs of digestion and secretion, to supply nervous power for the performance of their functions; and to the heart and lungs; also to the walls of the blood-vessels, which they accompany throughout the entire body for the special purposes of nutrition, secretion, and excretion. You must further recollect, that the same kind of *ganglia* or *nervous centres*, with their nerves, are supplied to the other organs and parts of the body, and are named according to their locality; as the *thoracic*, the *lumbar*, the *sacral ganglia*. Through their branches of nerves they freely communicate with each other, and with the other systems of nerves. Indeed, this *organic* or *sympathetic system* has the special office of connecting all the organs and parts of the body in the sympathy and harmony of health; and in painful association in disease. I have already alluded to this *sympathetic*, or *organic*, or *ganglionic nervous system* as the source of *organic nervous power*, or *curative force*, and which acts such an important part in the animal economy, and to which I shall have to make frequent allusion in these letters. You will please, therefore, to consider and remember the statements I have made concerning it.

I feel sorry in being compelled by my limited space to refrain

from a more minute account of the anatomy and physiology of the three nervous systems of the human body. They strikingly display to us the sunbeam evidence of Divine benevolence, and Divine creative wisdom, and perfection of design. I here bethink me of the philosopher of old, who fell into the clutches of that accursed conclave, misnamed *the Holy Inquisition*, 'whose tender mercies are cruel.' He was accused of *atheism*. When brought before them to answer to the accusation, he took a glance around him; and then taking up a straw, which had stuck to his tattered robe whilst on his miserable pallet in the dungeon, he held it up and exclaimed, "*This is sufficient to convince me of the existence and omnipotence of God.*" True enough, dear Sir, were the words of that philosopher. But when we look on the exquisite structures, and uses, and adaptation of such parts of the human frame as are presented to us in the nervous systems, how stolid and depraved must be that mind that can fail to perceive the overwhelming evidence of the adorable attributes of the great Creator!

The nervous systems of man, the animal and the organic, and all the functions of the body performed through their instrumentality, are most intimately connected, and they act reciprocally on each other. Mark, then, that you may regard them as a *circle of influences*, at any point of which circle derangement and disease may commence. Thus, any part of it may become the primary seat of disease. Disease may arise from causes affecting the mind, or animal system of nerves. It may arise from causes affecting the organic nerves or their centres, the ganglions; or affecting the function of digestion in the stomach; or in the more advanced stages of assimilation of food; or affecting respiration; or nutrition in its last stage of *change of tissue*. Disease may arise from causes affecting directly any of the collateral functions of absorption, secretion, or excretion. I shall explain these three functions to you anon. Yet all these functions vary in their comparative power to affect each other. You must consider *organic nervous power* as the first one in the list, and whose derangement is most

productive of disorder of the others. It should therefore be the chief object of care to the practitioner of the healing art.

To refresh your memory, let me state a few important particulars connected with the *change of tissue*. Oxygen in the capillary or extreme arteries plays the chief chemical part in combining with the carbon of the effete or waste matter, which is then taken up by the capillary veins, for its removal from the body. The oxygen, you know, is procured mainly from the air taken in by the lungs, and is carried by the arteries to the various tissues which have to be renewed.

This process, in connection with organic nervous energy, becomes a chief source of *animal heat*. Carbonic acid is formed by the combination of oxygen with carbon, and heat is evolved because of a lessened capacity for it. You perceive, then, that the heat of the body must increase in proportion to the quantity of oxygen consumed in this way. Hence, by active exercise in mountain air, by which the respiration and the circulation of the blood are increased, the heat of the body also increases, until the natural cooling process is required, viz. the process of sensible perspiration or sweat. The healthy waste of the body is hastened, and with it the healthy stomach begins, by appetite, to demand a fresh supply of food.

On the contrary, when we lead inactive indoor lives, the circulation of the blood becomes comparatively inactive, the respiration becomes slow, the quantity of oxygen which we consume is comparatively less, and the temperature of our bodies is reduced. You can readily see that basking over a fire is not a proper mode of getting heat; at least, that it cannot be so directly conducive to health and vigour as is that of air and exercise. It does not promote the *change of tissue*, but rather prevents it, as does warm clothing, by superseding the natural function for generating heat. Keep in mind, that whatever diminishes the quantity of air in the lungs, and the quantity of blood which should circulate through them, must also diminish the heat of the body. It does so injuriously in retarding the change of tissue.

The fact just noticed is demonstrated in diseases which inter-

ferre with the action of the heart and lungs, as in asthma, and chronic affections of the heart; and especially in malignant cholera. The contrary condition of pulmonary consumption and fevers produce the opposite effects, in their morbidly increased waste of tissue, and consequent morbidly increased animal heat, although no food be taken.

Hence, you see how important become the circumstances connected with respiration; I mean pure atmospheric air and exercise, for the inhalation of oxygen, and for the vigorous circulation of the blood. This, you see, is an important point of the *circle of influences*, just stated above; and it surely strikes your mind how great and direct becomes the bearing of air and exercise on the functions of the body.

### LETTER III.

DIGESTION AND ASSIMILATION OF FOOD, AND THE ORGANS CONCERNED  
—LIEBIG'S DIVISION OF FOOD, AND THE FOUR PURPOSES REQUIRING  
IT—EFFECTS OF OUR BREACH OF THE LAW OF ANIMAL LIFE—FORM-  
ATION OF FAT—WINE, BEER, AND SPIRITS—EFFECTS OF ALCOHOL, &c.

MY DEAR SIR,

THE organs of digestion and assimilation of food are important parts of the *circle of influences*. You are aware how very frequently in civilized society these organs become the seat of primary derangement and disease. The principal causes are well known to be the use of improper food in both quantity and quality, with the use also of intoxicating drinks, and so much coddling, indoor life. I wish you to well understand these functions, and their connection with each other; and especially in their connexion with the *renewal of tissue*. Every one who is wishful to understand the mode of action of the Water Cure, and that of any other rational system of treatment, should possess a knowledge of the organs and functions concerned in blood-making and nutrition. It was my thorough

conviction of this which made me devote the first 73 pages of my small work on the Water Cure to that purpose. You will find that knowledge of great service in enabling you to appreciate what is stated in these letters.

Allow me, in brief recapitulation, to bring again before you the principal circumstances and facts which are more fully given in the volume alluded to. I again say, be not impatient of repetitions, as long as they bring before you useful and important knowledge: it serves the purpose of riveting it more firmly in your mind.

You remember that I stated that mastication of food is the commencing part of the process of digestion; and that due care should be taken to make it as perfect as possible. I alluded to the value of good teeth, and to the proper use of them in slow and careful mastication of food.

There are two important points connected with this: one is, that by minute mastication the food is rendered far more easy of digestion in the stomach. The other is, that there is less danger of overloading the stomach. For, food which has been imperfectly masticated and hastily swallowed will not satisfy the appetite as will that which has been slowly and carefully chewed.

I may add, that the same truth applies also to drink for satisfying thirst, as well as for the purpose of stimulation. Hence, your practised and knowing tipplers, in their use of alcoholic drinks, always take them slowly and in mere sips; and they can in this way procure a greater stimulating effect from a less quantity of drink. In illustration of this fact, I now recollect of nearly a whole company of soldiers who became intoxicated on board of ship by drinking a comparatively small cask of wine by means of a small gimlet and a straw through which they had sucked the pilfered liquor.

Again, I pointed out the source, the use, and the solvent power of the saliva or spittle, in its mixing with the food, and in preparing it for the further action of the gastric juice in the stomach.

You recollect that the food undergoes its first great change



in the stomach, and that it *there* becomes *chyme*, according to technical language. The word is Greek, and means a *juice* or *fluid mass*. It remains in the healthy stomach an average time of two or three hours, subjected to the specific action of that organ and its secretion, the much-talked of *gastric juice*. When it is fitted for the next movement downwards, the *chymous mass* passes through the lower opening of the stomach, called the *pyloric orifice*. We have here again a Greek word for the part, namely, *pyloros*, which means a *porter* or *door-keeper*. The term is good, for no matter is allowed by it to pass forwards into the first bowel unless it be in a proper state for it. The *pyloros* or *pylorus* is usually very vigilant; that is, it is very sensitive. Indeed, it is endowed with an *elective power* suitable for its important office. Through this sensitive and elective power it will raise a commotion in the stomach, and cause vomiting, when anything of a nauseous and improper nature presents itself for admission into the first bowel, called the *duodenum*. This term, I told you, is of Latin origin, and means *twelve*; because, say the anatomists, its length is about twelve inches.

Respecting this elective power, or peculiar sensibility of the pyloric orifice of the stomach, I have to apprise you that it is frequently much deranged and destroyed by the intemperate use of stimulants; so that it loses its healthy condition, and then allows improper matters to pass into the small bowels, to interfere with their important function, and thus to cause unhealthy chyle. Sometimes, however, a more violent disturbance of the function of the bowels is caused in this way. They are roused to hurry the offending matters through their course by a diarrhoea, and thus to rid themselves of them. You see how wisely these important organs are protected by their peculiar and innate sensibility. Frequently also, from the same cause of intemperance, especially in the use of undiluted spirits or dram-drinking, this pyloric orifice becomes the seat of incurable and fatal disease, namely, schirrus or cancer. Under this disease the sensibility is morbidly increased, and constant vomiting takes place as soon as the contents of the stomach

reach it for admission into the duodenum. On examination of such cases after death, I have usually found the part ulcerated; but this does not always take place. Napoleon Bonaparte died of this disease; but he had an hereditary predisposition to it from his father, who also died of it. Napoleon had too much shrewdness, common sense, and love of life to stultify himself by those habits which so often cause cancer of the pyloric orifice of the stomach.

When the alimentary mass has passed into the duodenum, it is called *chyle* by nearly all physiologists. This is also a Greek term, meaning *juice*, or *sap*, or *fluid squeezed out*. I have ventured, on just grounds, I think, to continue the name of *chyme*, for reasons given in my treatise on the Water Cure. However, it does not much matter about the name. You must keep in mind, however, that the mass undergoes great change in the duodenum, where it meets and is mixed with two other fluid secretions of particular properties. One is the bile, which is brought from the liver by a duct or canal; the other fluid is the *pancreatic juice*, brought from the *pancreas* or *sweetbread* by another duct. Besides these two fluids or secretions, there is also the special fluid which is secreted or formed by the lining membrane of the duodenum, and which is of a very solvent nature.

The alimentary mass soon passes onwards into the next part of the bowels, called the *jejunum*, a name given from the Latin, and meaning *fasting*, because the bowel is always empty on dissection after death. The mass is then passed forwards into the *ilium*, the next and last of the *small bowels*. These are so called because of their comparatively small dimensions. In the two latter ones, the *jejunum* and *ilium*, is chiefly absorbed from the alimentary mass the *milk-like* fluid to which alone I would apply the term *chyle*, and not to the whole mass from which it is taken, as do other physiologists. This chyle is absorbed by the absorbent vessels, which in this place and office are denominated *lacteals*, because of their *milk-like* contents, which they absorb from the alimentary mass. I shall say more about these lacteals anon.

Here we must leave the remaining mass, which takes its course downwards into the *larger bowels* called the *cæcum*, the *colon*, and the *rectum*. You must keep in mind that the soluble or fluid part of this alimentary mass is usually absorbed by veins into the blood; whilst the insoluble matter, chiefly, is passed onwards and downwards. This absorption is not, however, to the extent that some writers would have us to suppose. I would just remind you that the liquid part of the *fæces*, or excrementitious matter, is chiefly secreted from the blood on the internal surface of the large intestine called the *colon*, where the *fæces* proper are first formed.

To return to the *lacteals* or *lacteal absorbents*. The chyle is the nutritious part of the alimentary mass, the essence of aliment. It is conveyed from the small intestines by these lacteals to a kind of oval-shaped bag, the reservoir of the chyle, and therefore called, in technical language, the *receptaculum chyli*, the receptacle of the chyle. It rests on the front of the spine of the loins, and receives or is formed by the termination of the large trunks of these lacteals and the trunk of the *lymphatic absorbents* of the lower extremities. In this reservoir or receptacle the chyle and the lymph carried by the lymphatics are mixed together. At its upper part it is formed into a large tube or duct, and then takes the name of *thoracic duct*, because its principal course is within the *thorax* or chest. It ultimately delivers its contents into the part of union between the left subclavian and the left jugular vein; and being mixed with the venous blood, it soon arrives at the right side of the heart; and then into the lungs, to be there exposed to the assimilating influence of the oxygen of the atmospheric air inhaled. You must turn to the engraving No. VIII., and you will see a correct representation of this statement.

You remember the anatomy of the heart and lungs, as described in the preparatory part of my other treatise. The heart, you know, is placed between the lobes of the left lung; and is a very strong muscular organ, composed of two distinct and separate halves, for separate purposes. The right half receives the dark-coloured venous blood from all parts of the body, and

with which is commingled the chyle of the thoracic duct, and it circulates this mixed and impure blood through the lungs, where it meets with the purifying oxygen. You remember that this oxygen of the atmospheric air combines with the carbon of the venous blood, and with a portion of its hydrogen, to form carbonic acid and water, which are immediately expired in the breath. That the black-red venous blood is changed by the exposure into bright vermilion red arterial blood, which is also surcharged with oxygen. In this state it is received by the left half of the heart, and by it is circulated through all parts of the body for nutrition, change of tissue, life, and organization.

I have not yet informed you of the composition of the blood. It is quite necessary, however, that you have some knowledge of it, because of its intimate relation with health, disease, and its treatment. The human blood consists of many component elements. Its proximate compounds are included in the following, namely, *fibrine*, *albumen*, *salts*, and *red corpuscles* or particles suspended in the watery fluid called, in technical language, *liquor sanguinis*, or the liquid of the blood. These different compound substances can be separated from the blood by analytic processes.

Some variety of opinion still exists on the supposed uses of these several compounds. I can safely state to you, however, that the fibrine is the chief substance for the purpose of nutrition of the body in the *renewal of tissue*. The salts of the blood are of different kinds, and in them are compounds of iron. It is an established doctrine that the *salts of iron* in the blood become the cause of its redness, and are also concerned in its *electricity*.

The internal structure of the heart is of excellent adaptation for the purposes designed, in its auricles and ventricles, and its different valves; also in the strong membranous bag which contains it, and which is called the *pericardium*. The lungs occupy the chest, and are in the form of lobes; there being three in the right side of the chest, and two in the left one, between which is placed the heart, occupying, as it were, the place of a lobe. The heart and lungs, you perceive, are properly de-

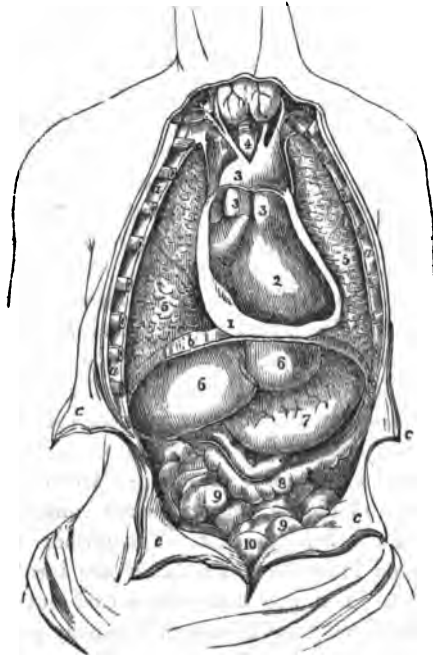
nominated the secondary and finishing organs of digestion and blood-making.

On the next page I have appended a woodcut engraving of the essential organs, that you may have their correct relative position to each other before you.

You must keep in mind, dear Sir, that all these organs just stated perform the functions of organic life; and for this they have their system of *organic nerves*, with the *organic nervous centres*; called *ganglions*, or *ganglia*, a Greek word for *knots*, because they are in the course of these nerves like knots. And know, also, that the functions of animal life have a distinct system of nerves, of which the brain may be considered the one great ganglion. These particulars I have alluded to before; nevertheless, I repeat the allusion to their existence, to impress your non-medical mind more strongly concerning them; because they are of such momentous bearing, and ought to be well known and remembered.

You must not forget that the *organic nerves* are always without feeling in their healthy state; and that the *animal nerves* only are the instruments of sensation. Surely you cannot but perceive the Divine wisdom and goodness displayed in this arrangement. You see that all the vital functions are in this way carried on without our consciousness or feeling, and equally without our will or part in the matter. Were it otherwise, we should become our own destroyers in many ways. But what things are indispensable for our health, and comfort, and very existence, are placed beyond our observation and control. How supremely wise and beneficent is this arrangement!

I have now given you a brief account of the digestive function; also of the lungs and heart, the organs of respiration and circulation of the blood, which latter are the finishing processes for the one purpose which they all serve, namely, the nutrition of the body. I will now briefly treat of the function of nutrition in its association with other important functions. I mean the generation of heat, and the formation of the animal substance called *fat*, in connection with the renewal of tissue, and

Fig. IV. — *The Organs in their connection.*

- n.* The cut edges of the ribs, forming the lateral boundaries of the cavity of the thorax.
- b.* The Diaphragm, forming the inferior boundary of the thorax, and the division between the thorax and the abdomen.
- c.* The cut edges of the abdominal muscles, turned aside, exposing the general cavity of the abdomen.
- |  |                          |
|--|--------------------------|
| 1. The cut edge of the pericardium turned aside.             | 5. The lungs.            |
| 2. The heart.  | 6. The liver.            |
| 3. The great vessels in immediate connection with the heart. | 7. The stomach.          |
| 4. The trachea, or wind-pipe.                                | 8. The large intestines. |
|  | 9. The small intestines. |
|  | 10. The urinary bladder. |

the action of the heart and lungs. This will make it necessary that I notice the different kinds of food, and the various purposes they serve in the animal economy.

I must remind you that many animal and vegetable substances consist of the same elementary ingredients in but slightly different proportions to each other. These ingredients are *oxygen*, *hydrogen*, *nitrogen or azote*, and *carbon*. Of the animal and vegetable substances, I mentioned *starch*, *sugar*, *gum*, and *fat*. I may add, that the bile, which the liver secretes from venous and carbonized blood, is so nearly allied to fat, in its component elements, that they are convertible into each other.

I have also already stated that nitrogen is the chief and distinguishing element of animal matter, whilst carbon is equally the fundamental element of vegetables. Again, you are to recollect that the tissues of the body are formed from the blood; and it therefore follows, that only those alimentary substances which are capable of conversion into blood can serve to build up the human frame in its three principal component tissues, namely, the muscular, the nervous, and the cellular.

Liebig has divided the food of man into two classes, which he terms nitrogenous and non-nitrogenous; azotized and non-azotized; meaning, of course, that one class contains nitrogen or azote, whilst the other does not. The former are capable of being converted into blood, the latter are incapable of such transformation. You now understand that out of the former are formed the three great tissues of the body just mentioned; and you must especially notice, that the other class of substances, in the normal state of health, serve to support the process of respiration. Liebig terms the former class the *plastic elements of nutrition*; and he terms the latter the *elements of respiration*. I must explain, to be plain, that the word plastic is of Greek origin, and signifies, in the verb, *to form*, that is, the elements out of which are formed the three tissues of the body, namely, the muscular, the nervous, and the cellular. Among these he reckons *vegetable fibrine*, *vegetable albumen*, *vegetable caseine*, *animal flesh*, and *animal blood*. Among the elements of respiration are *fat*, *starch*, *gum*, *cane-sugar*, *grape-sugar*, *sugar of milk*, *pectine*, *bassorine*, *wine*, *beer*, and *spirits or alcohol*. There is another proximate principle called *gelatine*, which may be classed among the plastic elements; but it serves only to

form certain parts of the body, namely, the membranes, the cartilages, the ligaments, and the soft part of the bones. I may just mention, *en passant*, that this is often used as food under the name of jelly, and is made most frequently from the feet of calves. It also abounds in strong soups. Many persons are quite mistaken in the notion that in these forms it is extremely nutritious. Certainly it thus becomes a suitable and useful article of diet for invalids, in supplying, in a prepared form, the component material of the certain parts just specified; but no muscular substance or flesh, no nervous nor cellular tissue, can be formed from it. Dogs that have been fed on it exclusively for a length of time have died of starvation; and so, likewise, would human beings.

Now, you must keep in mind that the three plastic elements of nutrition, termed fibrine, albumen, and caseine, which differ in their external appearance, contain exactly the same proportions of organic elements, and can be easily converted into each other. Mark me, that by proper chemical processes, they are all found to contain a chief and fundamental principle, which is called *proteine*, meaning in Greek, *chief* or *first*. You must keep in mind this word *proteine*, for it is regarded, as I have said, the chief and fundamental element of nutriment or plastic food for the human body. It is the nutrient part of wheat, and can be equally procured from fibrine, albumen, and caseine.

Remember, that our food is required for four different purposes. *First*, for the original construction or building up of the body. *Second*, to supply the continual waste or decay of the body, which goes on even in a state of repose. *Third*, to supply the waste of the body which always takes place from the active exercise of the muscular and nervous systems. And *fourth*, to supply the materials of calorification or generation of heat in the body, which is necessary for its vital actions. You can readily suppose that the amount of food required for the purposes just mentioned will vary according to the exercise or the repose of the body; also, according to the external heat or cold to which it may be exposed. It varies, also, according to age. For, during childhood and youth, when the growth of the



body is proceeding, a larger supply of food is required. Again, in the adult age, when the full stature of the body has been attained, a smaller quantity will suffice. You know that a child requires more food than the adult, in proportion to his comparative bulk. This takes place because of the much more rapid change of tissue. It is also evident from the large proportional amount of all his excretions; also, from the quickness with which the effects of illness, or of deficiency of food, show themselves in the diminution of bulk and firmness of the body. Likewise from the short duration of life when food is altogether withheld: as well as from the readiness with which losses of substance, by disease or injury, are repaired, when the nutritive function is restored to its wonted activity.

You will be aware that the opposite extreme of all this is the case in advanced life. The excretions diminish in their amount. Abstinence from food can be borne for a longer period. Losses of substances are more slowly repaired; and, indeed, everything indicates that the change of tissue is performed with comparative slowness: accordingly the demand for food is far less, in proportion to the bulk of the body, than it is in adult age; and may even be less than in that of the child a fourth of its weight.

I wish you to have a clear understanding of the subject just now before us, the knowledge of which will be of constant use to you. I will aim at the greatest plainness of language, and, as heretofore, I will not hesitate to use repetitions, that you may not only understand, but remember what I am teaching you. You must bear in mind that animal heat is indispensable to animal life: also, that the body possesses the power of maintaining itself at a certain necessary temperature or degree of heat of  $98^{\circ}$ , called blood heat. Remember, that in all climates of the world, and in all the variety of external circumstances which tend to increase or to lessen the temperature, the human body retains the same amount of heat, with very trifling difference. You must really keep this in mind; for on that will greatly depend your comprehension of the other points with which it is closely connected.

This animal heat in the human body is produced by the combinations of oxygen with carbon and hydrogen in the ultimate textures of the body : and this oxygen is procured principally by the lungs from the atmospheric air in the process of respiration ; and in less extent by the skin also, from the same source. The carbon and hydrogen are introduced into the human system with the food.

You now will readily comprehend what Liebig means in terming the non-nitrogenous or non-azotized substances of our diet *elements of respiration* ; he might have called them *elements of calorification or generation of animal heat* : for these are the substances which are almost entirely composed of carbon and hydrogen ; and are easily converted into each other. You know that oxygen is the great agent in the renewal of tissue, in combining with the carbon and hydrogen of the effete or decayed matter, and thereby forming carbonic acid and water, and being thus the cause of animal heat.

You perceive, that in order to preserve the bulk, the newness, and the vigour of the body at an equal standard, it becomes necessary that a proportionate quantity of plastic or proteine elements be supplied, as well as the elements of calorification and respiration. This must be in exact proportion to the demands for both, which will be according to the amount of exercise of the muscles and nerves, the amount of exposure to cold, and the amount of oxygen inspired by the lungs, and the quickness, also, of the blood circulation. These functions, with their exercise and requirements, are united in simple and beautiful harmony. When you take active exercise in the mountain air, the action of the lungs and heart is increased ; more oxygen is inhaled, and is carried with increased quickness to the ultimate tissues ; their waste is hastened ; and the carbon and hydrogen of non-nitrogenous substances are also acted on ; the animal heat is increased in proportion, until the cooling function of the skin is required to regulate it by sensible perspiration and evaporation. Soon the digestive organs participate in the effects, and begin to demand, by hunger, a fresh supply of aliment.

The normal process of renewal of tissue is a great means of calorification. You see, however, that in addition to the plastic or proteine elements for the supply of the waste of tissue, a due supply of the elements of respiration is requisite, to keep up the due supply of animal heat. This amount of supply will be required in proportion to the exposure of the body to external cold. You can see, at once, that it must vary greatly according to climate and other circumstance. The inhabitants of the arctic regions, the Greenlander, and others, will need for food something beyond the plastic or proteine elements of fibrine, albumen, and caseine. Accordingly, we find that they instinctively devour large quantities of whale blubber, and the fatty bodies of seals and the sea-horse, which abound in carbon and hydrogen. And how providential that these animals live in such desolate regions! Again, the inhabitants of tropical climates nauseate all such substances, and live on fruit and vegetables, and they take a less quantity of food. You see, that with the Greenlander the coldness of the air acts powerfully in two ways: that is, the cold and condensed air which he breathes contains more consuming oxygen in a certain bulk; and then, its internal and external application increases the demand for the generation of heat, and for carbon and hydrogen, which are the means of it. Of course, the contrary condition of the Hindoo, in a tropical climate, acts in an opposite direction. The lesson which we have to learn is the proper regulation of our diet and habits of life to the requirements of our temperate climate, in order that we may enjoy the blessings of health and long life. You now see, that the man who takes much active exercise in pure and cold air will require a very different kind of diet from that of him who lives an inactive life within doors.

You now understand why the quality and quantity of our daily food ought to be regulated according to our habits of life, and according to the degree of heat or of cold to which our bodies are exposed; also that active exercise in cold mountain air will increase the demand for both plastic and heat-causing elements; and *vice versa*. And such, you well know, is our experience. In winter, and especially whilst taking active ex-

ercise, we have the instinctive desire for stronger food, for flesh meat, and the more fatty kinds of it, which we loathe during the hot sultry summer.

But, let us look a little further, and consider the effects of our breach of this law of the animal economy. We find abundant illustration of such effects around us. In civilized society the breach may be called the rule or custom, and the reasonable observance of the law the rare exception. Here and there, only, we meet with a sensible person who, with abundant means of indulgence and excess, still holds the reins, and curbs his appetite; and he finds encouragement and reward in bodily and mental health and vigour, freedom from disease, and the enjoyment of long life. Error of diet, both in quantity and quality, is continually committed by the people of this country; and more particularly, I believe, by the middle class, although in different degrees of extent, according to many circumstances. Surely, you can now comprehend that an excess in the quantity of food, containing a superabundance of both plastic elements and of the elements of calorification, must be attended with very unfavourable effects on the human body, unless there be effective means in operation for removing the unused substances from the system. The lungs, the skin, the liver, the bowels, and the kidneys are the organs of excretion, for removing useless and noxious matters from the body. You are already acquainted with their separate functions. But I wish to call your attention again to that of the liver, especially in connection with excess of food, and the formation of the animal substance called *fat*, and in technical language, *adipose substance*.

I have already apprised you that bile consists, to a great extent, of carbon and hydrogen, along with other ingredients. Also, that it is so nearly allied to *fat*, in its nature, that they can be converted into each other, with very trifling, if any, difference. You can easily suppose, that amid the excitement and excessive action of all the organs of excretion, under habitual excess of food, the function of the liver will be specially moved to excessive action and excitement. And so it is, but it is at length overworked, as are the other excretory organs; and

hence it is usually the first to become disordered and diseased. To be brief, and to keep to our point, the carbon and hydrogen of the food which do not find a sufficient outlet from the body either by the liver or the other organs, are united to form *fat*, which is deposited in the cellular tissue of different parts; at first, it is placed where it can serve to protect important organs, as those of the abdomen; and afterwards in other parts, until it becomes a hinderance to bodily activity.

The component elements of adipose matter, or fat, are the superfluous and unconsumed elements of calorification, the heat-causing elements; and, under other and opposite circumstances, they are often again required by the wants of the system. This occurs more rarely to the human system than to that of certain warm-blooded animals. The circumstance has illustration in the well-known fact, that in them a store of fat in their bodies becomes a means of supply for the generation of heat, against the time when it may be needed. Hence it is found, that when they are deprived of all food, the duration of life in them is in proportion to the amount of fat they have previously accumulated. Animals which are liable to great privation during the winter, or which spend that period in a quiescent state of what is termed *hibernation*, have a great tendency to accumulate a large store of fat in the previous autumn. This depends on the nature of their food. We see it, particularly, in those birds and mammals which live upon seeds and grains. When these become ripe, they abound in carbon and hydrogen in their oily matter; and thus they become suitable food for the purpose of fattening.

Again, in regard to the common practice of fattening cattle, you also see the point illustrated. The animals are fed upon those substances which most abound in carbon and hydrogen; such as oil-cake of linseed, and food containing either saccharine or oily matter: and, whilst the animals are thus in preparation for the butcher, they are kept in a state of rest; and, as much as possible, in a warm atmosphere. The same principle is likewise in constant operation in regard to the human body, with those individuals who eat largely of fatty and saccharine food,

who take little exercise, and who wear much warm clothing. You see, that excess of clothing prevents the exposure of the body, and thus prevents, also, the internal demand for the generation of heat; prevents the consumption of carbon and hydrogen; and, consequently, favours the formation of fat.

Let us glance at the effects of excessive eating on the human system in another direction. I mean the excess of *nitrogenous* or *azotized* elements. When the supply of such food becomes much beyond the wants of the system for the renewal of the muscular, nervous, and cellular tissues, you must not suppose that it can, in any way, be stored up in solid flesh, in the manner that non-nitrogenous food causes fat to be stored up. You must bear in mind, that the increase of muscular substance depends on the exercise of the muscles. Certainly this increase cannot take place without a proportionate supply of plastic elements of food; but, do remember, that no degree of richness of blood, nor amount of proteine plastic elements, can produce increase of muscular substance and muscular power. Remember, that any accumulation of such nutritive matter in the blood can serve no purpose but that of evil, and to produce disease.

We are constantly witnessing the fact, that those who indulge in what is called high living, as to quantity and quality of food, are proportionately liable to disease and death. Those organs of the body which can serve, in a limited degree, to relieve it of excessive fulness and richness of blood through their functions of excretion, become disordered and diseased from excitement and over-action; especially the liver and the kidneys,—the liver excreting hydro-carbonaceous elements, and the kidneys those of a nitrogenous nature. In the catalogue of evil consequences are to be reckoned—rheumatism, gout, apoplexy, palsy, and various inflammatory diseases; and life itself is placed on a slippery foundation. Thus, dear Sir, we too often see the advantages of riches insanely overbalanced by the evils they are made to bring upon their possessors; whilst the sons and daughters of poverty and want have often the compensating blessings of health and long life. I need not tell you, that

not one of a thousand of the latter class duly appreciates the advantages he enjoys ; for it is more of necessity than of choice that they belong to him.

Wine, beer, and spirits are in Liebig's list of *elements of respiration*. You can now understand how the habit of taking these intoxicating drinks becomes so very injurious to the human frame. You are aware that alcohol is the enemy which lurks in all of them. It is a powerful enemy.

Whatever may have been the mistakes or the mismanagement of Total Abstinence Societies, they have certainly effected an incalculable benefit to the world, in disabusing the public mind of the very erroneous notion which long prevailed concerning alcoholic liquors: namely, that the internal use of them can be necessary, or at all conducive to the health and strength of the human body. These societies have been the means of making more known to the world the great fact, that the use of alcohol in the various beverages of wine, beer, and spirits, has ever been a giant evil, and the most prolific cause of human crime, and misery, and disease, and death.

Without further allusion to it as a dreadfully demoralizing agent, you can now understand its injurious action on the human frame. Alcohol, you know, consists chiefly of carbon and hydrogen, with a very small amount of oxygen. It acts very harmfully on the brain and nerves, as a noxious stimulus. Besides this, however, you can now see how harmful must be its action on the entire tissues of the body. By its carbon and its hydrogen it continually robs the blood of that oxygen which ought to act in preserving their freshness and purity. Mark you, it ever tends to keep the arterial blood of venous character. Think of this: for it is a point of great concernment.

As I stated in my treatise on the Water Cure, "no wonder that nutrition becomes imperfect; and that the liver, the kidneys, the lungs, and the skin are deranged in their functions; and that the waste and noxious matters of the body find not their proper outlets, because of the constituents of alcohol which combine with that oxygen which is required to unite with those matters for their elimination. It is readily ac-

counted for why such individuals possess unhealthy blood and unhealthy tissues, and have so little power to resist the influence of morbid agents. No wonder that with blood so deficient in vivifying oxygen, and so replete with qualities of opposite nature, such persons are without energy; and their brain being so supplied, that they suffer from lowness of spirits, excepting at the times when they are under the hurtful stimulus of alcohol."

The action of alcohol on the human system has been more strictly investigated and more correctly defined of late years than formerly. Although certain cases and emergencies may require the occasional use of wine, beer, or spirits, the continued and habitual use of any of them becomes very unfavourable to health and long life. You can now understand why such fatal disease of the liver so constantly overtakes the tippler and drunkard. The liver in such people becomes doubly liable to disease: the blood which flows through it becomes charged with the alcohol which has been taken into the stomach: and thus the liver becomes wrongly stimulated, and its biliary secretion is increased and vitiated. This is a great evil, and a frequent cause of disease and death.

Besides this, however, the liver suffers the great evil of being overworked in order to eliminate or to rid the body of surplus refuse matter caused by the action of the carbon and hydrogen of alcohol. These have robbed the blood of its oxygen which was to have combined with and eliminated the same by the proper outlet of the lungs. In addition to liver disease, the use of these alcoholic beverages is particularly liable to cause disease of the kidneys through the like mode of excessive stimulation. You can now perceive how greatly and how wrongly they must impede the depurating processes of the human system; and, consequently, how impure and unhealthy must become the blood and the entire tissues of those who habitually use them.



## LETTER IV.

ABSORBENT SYSTEM—LACTEALS AND LYMPHATICS—GLANDS AND VESSELS—PROOFS OF ABSORPTION—ENDOSMOSE AND EXOSMOSE—THE THREE GRAND SURFACES OF ABSORPTION, &C.

MY DEAR SIR,

THAT the function of absorption is highly important, must be sufficiently manifest, so deeply is it concerned both in the causation and in the removal of diseases. Therefore it becomes quite necessary that you have a clear understanding of its entire nature. You will, I hope, give me your earnest attention whilst I treat concisely on this very interesting part of the wonderful and most admirable system of man.

The function of absorption is a very extensive one, and the action of the absorbent vessels is constantly going on. Every fluid and solid of the human body, in all its tissues, are subject to the process, and by it all the component parts of the body are continually undergoing renewal.

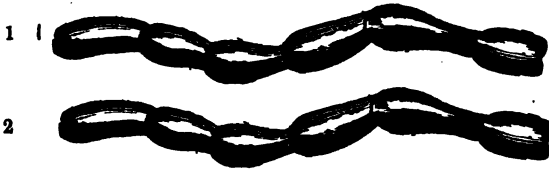
The instrumentality or apparatus of the absorbent function has been termed *general*, and *special*. Blood-vessels and membranes are the general apparatus. The special apparatus consists in a certain system of vessels exclusively for the purpose; these are the *lacteals*, and the *lymphatics*; having also a certain system of glands in connection.

The lacteal absorbents have been already mentioned by me, as the means of removing the nutrient part of the food from the small intestines to the thoracic duct, by which it is conveyed, mixed up with the lymph, to be commingled with venous blood about to enter the heart. After due assimilation in the lungs, it constitutes the nutrient part of arterial blood for the purposes of nutrition. The lacteals are the *special absorbents* for their important office as noticed above, and they arise from the internal surface of the small intestines.

I wish you to keep in mind, that the other special absorbents, the *lymphatics*, which carry a *water-like* fluid, and hence their

name of *lymphatics* (*lymp<sup>h</sup>a* is a Latin word for water), are to be found in every tissue both of the internal and external parts of the body. The structure of both kinds of absorbents is very similar to that of the veins, which also act as absorbents, in addition to their office of carrying dark and impure carbonized blood. The coats of the veins, however, are thicker, and not so transparent as those of the lacteals and lymphatics. Here you have a view of an absorbent vessel in its internal and external surfaces.

Fig. V.



A magnified view of an absorbent vessel. 1. Represents the external surface with the jointed appearance produced by the valves. 2. Represents the same vessel laid open, showing the arrangement of the valves.

When these absorbents are fully distended by their contents, they have a jointed appearance, as you see here. The point of each joint is caused by a pair of valves on the internal surface. Here again, dear Sir, is sunbeam evidence of design. These valves are evidently for the purpose of preventing the reflux or backward motion of the fluid within. You recollect that the same means answers the same end in the structure of the veins, and especially in the large ones of the lower extremities. It is this which gives a knotted appearance to the legs of some people, who suffer from varicose veins.

Allow me to state to you further on this point, that the veins and absorbents have not, like the arteries, an impelling engine, as the heart, to force forwards their contents; therefore they need and have the auxiliary means of valves. The arteries have no valves, because they receive the impulse of the heart with which they are connected at their outset in the aorta. They

have, besides, an inherent power of circulating their own contents, arterial blood, which is the oxygenized, nutritious, and scarlet-coloured vital fluid.

Doubtless, the lymphatic absorbents arise from every part of the body. Although, like veins, they anastomose with, or open into each other, they do not, like them, proceed from small to larger branches, and from these branches to form large trunks. The absorbents, remember, continue of about the same size in their whole length, from their origin to their termination. Remember, also, that the chief of these lymphatic vessels are arranged in two orders or sets; one of them is on the external surface of the body, the other is disposed in a deeper course, and more especially to accompany the large trunks of blood-vessels.

It is of importance that you recollect, that every lacteal and every lymphatic absorbent of the human body goes, in some part or other of its course, through an absorbent gland. These are called *conglomerate*, in contradistinction to others called *conglomerate* glands, which are made up of a congeries or collection of smaller ones; whereas, these are single or one in substance. I must apprise you, that the absorbent glands are small and usually oval-shaped bodies, and are enclosed in a membranous covering. On the next page you will see I have given a magnified view of them.

The glands of the lacteal absorbents are also called *mesenteric glands*, because they are located in the large and powerful membrane, the *mesentery*, which has its name from its principal office of retaining the intestines in their proper position. On page 46 I present you with a view of the absorbent glands of the lacteals, with part of the small intestine, and the *receptaculum chyli*, with the *thoracic duct*, &c.

The glands of the lymphatic absorbents are of various sizes, and are placed in certain appropriate parts of the body. They are sometimes single, but more frequently they are in groups or masses, as in the axillæ or armpits, and in the groins, at the bending of the knee, and under the jaw-bone. They readily enlarge from irritating causes. When an absorbent gland in-

flames and enlarges, especially in the groin, it is called a *bubo*, in professional language, which, in Greek, means a *swelling*.

Fig. VI.

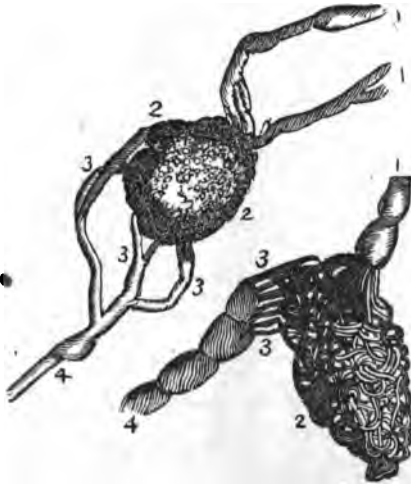


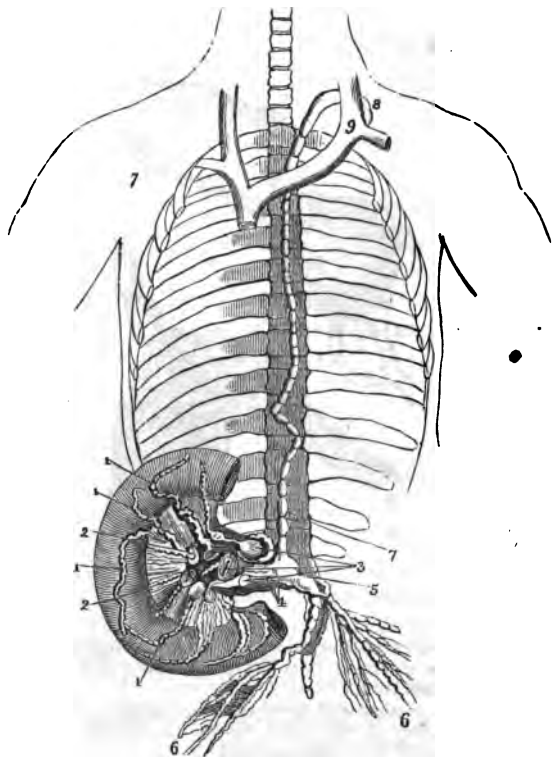
Fig. VII.

FIG. VI.—1. Absorbent vessels called *vasa inferentia*, entering (2) the gland. 3. Absorbent vessels emerging from the gland, called *vasa efferentia*, and forming (4) a common trunk.

FIG. VII.—1. Trunk of absorbent vessel entering a gland. 2. Gland apparently composed entirely of convoluted vessels. 3. Vessels emerging from the gland, and forming (4) a common trunk.

The absorbent vessels which enter a gland are termed *vasa inferentia*, or in-going vessels. They enter at the part of it most distant from the heart. Again, those which leave it are termed *vasa efferentia*, or outgoing vessels, and are seen to emerge on the side next to the heart, and are fewer in number than those which enter it. The whole substance of an absorbent gland appears to be made up of the *vasa inferentia* convoluted or rolled up, and having free communication with each other.

Fig. VIII.—View of the course of the Thoracic Duct, from its origin to its termination.



1. Lacteal vessels emerging from the mucous surface of the intestines.
2. First order of mesenteric glands.
3. Second order of mesenteric glands.
4. The great trunks of the lacteals emerging from the mesenteric glands, and pouring their contents into (5) the receptacle of the chyle.
5. The great trunks of the lymphatic or general absorbent system terminating in the receptacle of the chyle.
6. The Thoracic duct.
7. Termination of the thoracic duct at (9) the angle formed by the union of the internal jugular vein with the subclavian vein.

Although, as I have already stated, the absorbents have no impelling organ to send forwards their contents, yet the fluid they contain is known to move onwards with considerable force ;

and we reasonably suppose, therefore, that they possess a vital and inherent power for the purpose.

Again I counsel you, to remember the particular facts and circumstances noticed by me in this brief account of the absorbent system ; for, assuredly, the subject has a constant bearing on the health and diseases of the human body ; and for success of treatment the practitioner must understand and think of it. There are yet other and very interesting particulars which I must next bring before you. If I refer again to some things already mentioned, the repetition will serve, I say, to impress your mind more deeply on useful knowledge.

Mark, then, in reference to the special office of the lacteals to absorb chyle from the alimentary mass in the small intestines, that they scarcely ever absorb any other fluid matter, to whatever extent it may be presented to them. These lacteals, then, are endowed with a *special sensibility* for their purpose, and which makes them refuse to take up anything but chyle. It is called their *selecting power*. This is one instance of the like innumerable ones in the human system, where *special sensibility* belongs to organs and parts for their *special purposes* ; and is, indeed, beyond the power of the greatest intellect to understand. It is a part of the wonderful endowments which are observed in the animal economy ; but no more is known of them. They are truly of the greatest moment for health, and for life itself.

What an instructive and delightful study is that of the anatomy and physiology of the human body ! No wonder that the great and penetrating minds of Paley, Chalmers, and Edward Irving could derive so great pleasure and spiritual profit from years of mental application to this. I here state emphatically, that, second to the knowledge of the sacred Scriptures, in real value and importance, stands the knowledge which man ought to obtain of his own corporeal mechanism, by the study of anatomy and physiology, and of the laws of health and disease. Without doubt, no other knowledge or mental exercise can be compared with this in its legitimate tendency to deepen the impression of the former and primary one of the soul's great interest,

and to guard it from such as are false and delusive, and received from intercourse with mankind. The study of these sciences greatly tends to fix on the mind the declarations of the sacred volume respecting the perfect and glorious attributes of God, and to deepen its devout feeling.

To return. The lymphatics, which are distributed over the whole human frame, are not limited to the absorption of a certain fluid, as are the lacteals. The lymphatics absorb matters of various kinds, but they are always of an organized nature, and passing through stages of purification and fitness for the purposes of life. It was formerly believed that the contents of lymphatics were of a refuse nature, but this is now found to be erroneous.

I have to call your attention to the fact already alluded to, that the function of absorption is not confined to the two kinds of absorbent vessels just described. The capillary or minute blood-vessels, especially the veins, have also a great power of absorption. It has been proved beyond a doubt that veins will absorb all fluids which may be presented to them, and all matters which are soluble in such fluids. You are aware that it is by the absorbent action of the veins of the stomach that the water, which is sometimes taken in large quantity, so soon disappears from it. Also in other instances of large collections of fluid in the different cavities of the body, the veins perform the process of absorption, and remove them.

The absorbent glands are supposed to exert a certain influence on the fluids which flow through them in the absorbent vessels, and to assimilate those fluids more nearly to the nature of blood. That they do exert a power of altering the nature of such fluids is supported by the fact, that the injection of even bland fluids directly into the blood, without their passage through these glands, is often of most serious consequence; even fatal effects have followed.

Keep in mind, that the action of absorbents of all kinds is greatly affected by the state of the animal system; namely, the state of inanition or emptiness, and of plethora or fulness: that the more empty the condition of the body, the more energetic

the action of absorbents. This has been long known by intelligent practitioners of medicine. Hence the practice of blood-letting, and the previous administration of purgative medicines, before giving mercury and other medicines intended to act specifically through the absorbent system. Indeed, there is a certain degree of plethora or fulness of the human system at which no absorption will take place. This law of absorbent action is of great importance, and has much bearing on the treatment of disease.

You can perceive that by the above law of absorbent action we at once account for different known circumstances in connection. We can by it account for the keenness of appetite for food after long abstinence; and that the body so soon recovers its wonted fulness and size after fever; and, indeed, after a recovery from any disease by which it has been much reduced and emaciated. The absorbents are thereby made ready for action.

This law, again, affords us the correct explanation of the extraordinary success of the treatment of many diseases by the *hunger cure* of German physicians. It also has to do with the beneficial effects of spare diet, and why this becomes so greatly auxiliary to the great *water cure*, in curing certain diseases against which other modes have constantly failed.

Certain offices are performed by certain appropriate portions of the entire apparatus or instrumentality of absorption. Absorption, by minute blood-vessels, is connected with the function of every organ, but more particularly with those of digestion and respiration—the functions of the stomach and lungs.

You know that the absorption by the *lacteals* is for the purpose of supplying new material for repairing the waste continually going on in the human body through the vital actions. You have also to remember that the absorption by the lymphatics, which are distributed throughout the entire structure of the body, is for two purposes: it is, firstly, for conveying certain matters, which have been component parts of the body, into the blood current, to be again exposed to the purifying process of respiration in the lungs. Secondly, it is for regu-



lating the growth and proper form of parts in the renewal of tissue—the nutrition of the body.

In proof of the extent to which the animal body performs the process of absorption; if, in a state of inanition or emptiness, say, after an abstinence from food and drink for twenty-four hours or longer, the body be immersed in water or any other suitable fluid, it will increase in weight, and the fluid will be diminished in the same proportion. Other like proofs could be stated.

I may here inform you that absorption takes place in vegetable as well as in animal bodies, but in them it is necessarily more simple in its apparatus. The nutriment of plants is taken up or absorbed by their roots from the soil. Their leaves also absorb moisture; and hence rain and dew increase the growth of plants.

Further, regarding the human body. If a quantity of water be injected into any large cavity of the body, as into that of the abdomen or belly, formed by the lining membrane called the *peritoneum*; or, if a fluid be deposited there by disease, as is the case in dropsy, it may soon disappear: it may do so without any visible means: or it may be removed by the action of certain drugs which have been taken for the purpose. The removal of such fluid is always effected through the process of absorption.

Certain violent medicines will produce their well-known and specific effects on the human system as powerfully when applied to an external or internal surface, as when they are swallowed into the stomach; and especially if friction be used at the same time. It is known that mercury, opium, arsenic, tobacco, and strychnine will produce their full effects in this way.

You must understand, that when any organ or part of the body is diminished in size, or entirely disappears by being deprived of nourishment, or by constant and continued pressure, as by a bandage externally, or by the growth of a hard tumor pressing upon it, or by an abscess, that diminution or entire removal has been caused by the process of absorption. I have known, in such instances, the hardest bones removed by the

action of absorbent vessels. I now remember the case of an interesting woman, in whom the central parts of two ribs were removed by the pressure of an abscess of the right lung, whilst making its way outwards. The case was extraordinary and highly instructive. I asked for a *post mortem* examination, and got permission at once from the sensible but afflicted husband, then a young man, and now residing at Thirsk. I found the central parts of the fourth and fifth ribs gone, by the pressure of a bag of pus or matter, called an abscess, or vomica. The lungs were a mass of tubercles. The suppuration had commenced at the particular part of the right one directly opposite the ribs just mentioned, and became a large abscess, which discharged its contents of pus or matter through an opening I made with a lancet at the lower part of the right mamma or breast. She died of genuine phthisis, or pulmonary consumption; although she had no cough, and no spitting up of matter. She had, what we doctors term, *external expectoration*.

I shall never forget the exclamation of alarm and of extreme anxiety of that amiable young woman, when I first announced to her that she was going with rapid strides to the grave! However, she earnestly sought, and she found; she earnestly asked, and it was given unto her; she earnestly knocked, and the door of grace and mercy was opened unto her redeemed soul!

To quote the words of Dr Cumming, "Too many people have the idea that to be saved is a sort of long and laborious penance, or an arduous and difficult process. It is no such thing. It is look and live; believe and be saved. Be happy first, and be holy as the instant effect, action, and evidence of that happiness. I wonder how any man can live suspended between life and death—heaven and hell, without something like clear, intelligent, rational conviction, that if he were called upon to appear at the judgment-seat to-morrow, he could say, '*I know in whom I have believed.*'"

To return. You must recollect, dear Sir, that the entire apparatus by which absorption is carried on is of different kinds. The more special one is that of *lacteals* and *lymphatics*

with their absorbent glands; and which I have now described to you. The other, *that of the blood-vessels and membranes*, must be next treated of. Indeed, these two may be considered as one and the same as to their mode of absorbent operation, for it is of the same very interesting character. It is the special mode of transition or passage of fluids through the membranous tissue; of this tissue are constituted the coats of blood-vessels, as well as the internal and external surfaces on which the peculiar kind of absorption takes place, and of which I have now to give some account to you.

I beg your earnest attention, as I feel anxious to communicate a clear understanding of it to your mind. It concerns the function of *absorption by membranes*. If you take a portion, say an inch or two, of an artery or of a vein from the human body, and then tie each end of the same to the ends of two glass tubes or pipes, that you may have a current of warm water in the interior of the said portion of artery or vein, then place the same in another fluid slightly acidulated and contained in a suitable utensil, you will find that in a few minutes the fluid of warm water will become sensibly acid. The explanation is, that the acidulated fluid has passed through, or has been absorbed by, the coats of the blood-vessel. These coats, you are aware, are membranes, and this we call *membranous absorption*.

Again, if you can practise the cruelty of exposing the trunk of an artery or of a vein in a living animal, like some fellows who think nothing of cutting up living animals, and if you then apply to the exposed artery or vein a poisonous matter in solution, you will find that the poor animal will be destroyed, killed immediately; as soon as if the poison had been injected into the blood-vessel. I wish you to recollect that in the minute or capillary vessels of arteries and veins this absorbing power is in proportion to their minuteness, fineness, number, and extent.

This absorbing power of membrane affords us explanation of many things occurring in the animal economy, which I shall further explain to you hereafter. But something yet more difficult to understand respecting membranous absorption takes

place under certain circumstances. If you place an animal membrane in contact with water, it soon becomes saturated or filled with that fluid. If you place that membrane in contact with a compound fluid, say, spirit or water having colouring matter in solution, the membrane will positively decompose that compound, and reduce it to its component parts.

If you place one extremity of a piece of membrane in a vessel containing a coloured tincture, that is, a spirituous solution, say, of iodine, whilst the other extremity be kept out of it, that part of the membrane which has contact with the tincture will immediately assume its colour; because the iodine passes perfectly through the membrane; and, mark you, this dark coloured part of it is bounded by a fixed line, and just above this you will find that the membrane is penetrated by another and different part of the tincture; this is the colourless alcohol in which the iodine was dissolved; above this you will discern evident traces of another and lighter-coloured fluid, which is the small portion of water necessarily present in alcohol.

Likewise, if you place a piece of animal membrane in a glass of port wine, you will soon notice the same kind of decomposition. On the lower part of the membrane you will have the colouring matter of the wine; above this will be the spirit or alcohol; and above this you will have the water.

This most interesting subject of *membranous absorption* has been minutely investigated and ably explained by Liebig; and by many and various experiments he has proved the fact of decomposition of compound fluids by membranes. That whilst a membrane is imbibing compound substances in fluids, it also reduces them into their component elements.

Further, Liebig has found by experiments that the membranous absorption and decomposition of compound fluids take place in different degrees of facility, according to the nature of the compounds absorbed and decomposed. You will do wisely in recollecting these particulars; and that similar properties belong to living membranes. For instance, that the mucous membrane lining the stomach absorbs and also decomposes

different matters contained in its fluid contents : and that, consequently, living membranes in all animals perform important functions.

I have next to instruct you respecting a remarkable property of membrane, which is now frequently referred to by intelligent physiologists, and which you must understand, in order to properly comprehend the principal subjects of these letters. I believe that it was first noticed by M. Dutrochet ; and afterwards investigated more fully by Brucke ; and ultimately established by Liebig. I allude to the membranous process termed, in technical language, *endosmose* and *exosmose*. It is that process by which fluids in contact with both surfaces of a membrane pass through it in currents which proceed in opposite directions. This takes place according to the different qualities of the fluids, and especially in relation to their density or consistence.

M. Dutrochet took certain membranous bags, which form a part of the intestines of fowls, and filled them with fluids of different density : one he filled with milk, another with syrup, another with mucilage of gum arabic. He then tied those bags securely, and placed them in a large basin of water. He soon found that an interchange of the fluid within and without the bags began to take place by currents through the membrane of which they consisted ; and that these currents flowed in an opposite direction to each other. The current from without inwards was formed by the flow of the external water towards the denser fluid contained in the bags. The other and weaker current was from within outwards, and it was the flow of the denser fluid within the bags to the external water. The first mentioned, or in-going current, is called *endosmose*, from the Greek word *endon*, within, and *osmos*, impulse. The other, or out-going current, is called *exosmose*, from *ex*, out, or outwards, and *osmos*.

Liebig and others have investigated this process of *endosmose* and *exosmose*, especially in connection with vegetable membranes. It is, indeed, of extensive application to the physiology of plants. But it becomes of much more weighty concern in its

application to human physiology. I shall not undertake, in my limited space, to instruct you very minutely on the many interesting particulars of its application. You can readily suppose that it has greatly to do with the vital processes of the human body, which are performed in its various cells, cavities, and myriads of capillary vessels.

You must consider it as an established fact, that all the animal tissues have a powerful and innate property which enables them to transmit fluids, and also solids which are of a soluble kind, through their substance. Remember that membranous tissue becomes the agent by which this is effected, whether it be proper membrane, or in the form of the coats of blood-vessels; that by means of this property both fluids and solids are absorbed by the human body, with whatever surface or whatever organ of it they may be in contact. It will matter not whether that contact be with an internal or an external surface, or whether with the stomach, or the lungs, the liver, or the heart; whether it be with the mouth, or the eye, the nose, or the ear.

You can well suppose that this important property of membranes must have a weighty bearing on the concerns of health and disease; also that it must possess great influence in connection with the functions of the three great absorbing surfaces of the human body; namely, that of the lungs, the stomach, and the skin.

There can be no reasonable doubt but that this action of the membranes, in the transition of matters through their substance, affords the most satisfactory explanation of the extraordinary efficacy of certain processes of the water cure. It must at once strike your mind, that especially in the water *compresses* both local and general, and above all, in the *wet-sheet packing*, the whole arrangement becomes highly favourable for the effective agency of *endosmosis* and *exosmosis*. This I regard as an established fact; and in it you will perceive that there is the most rational cause for the highly curative power of these water processes. It most satisfactorily explains to us how it is that so much and such various kinds of noxious matters are

drawn out of the body, through the skin, by such means. No doubt there is constantly the operation of *endosmose* and *exosmose* whenever the compresses and wet-sheet packing are applied, although the extracted matter may not be visible to the eye.

Frequently, however, the fact of the extraction of noxious matter from the body by compresses and the wet sheet is known by its actual appearance in large quantity, and of a very offensive odour. I have witnessed it very often. I have seen the whole wet sheet of quite a yellow colour with the bile it had extracted from the human body, which was being poisoned by its presence throughout its textures. The wet packing-sheet is frequently so saturated with the offensive matter it has extracted, that it has to be removed from the room as soon as it has been taken from the patient.

During my three years' stay at Malmö, in the large and excellent hydropathic establishment of Dr Wilson, these things were of common occurrence, and came under my own observation in the many patients under my care in colleague with that shrewd and experienced practitioner of the water cure. Whenever I applied the *compresses* or the *wet-sheet packing* in cases of chronic diseases, especially of the liver, and in which much drug treatment had been previously undergone, I always calculated on seeing the extraction of these noxious matters.

I am glad to know that you have been instructed on the effective and scientific agency of the water processes, and that you also know of the extraordinary cures which have been accomplished by water treatment. You now can see the absurdity of those professional opponents who affect to sneer at the water cure. This kind of absurdity is a common thing with mankind, in opposing and vilifying that which they do not understand, and even have not seen. It just occurs to me here that the excellent physiologist of our day, Dr Carpenter, writes a paragraph in his work on human physiology, which is not very far off this kind of absurdity. He certainly displays his ignorance of the water cure when alluding to the wet-packing sheet. He writes of it—" *The hot-air bath, in some cases, and the wet*

*sheet (which, as used by the hydropathists, is one of the most powerful of all diaphoretics).*" It is not a diaphoretic at all, as the word is understood amongst medical men. He couples this wet sheet with the lamp-bath, and yet no two processes can be more different from each other in every respect. He writes further: "The absurdity of hydropathic treatment consists in its indiscriminate application to a great variety of diseases: no person who has watched its operation can deny that it is a remedy of a most powerful kind; and if its agency be fairly tested, there is strong reason to believe that it will be found to be the most valuable curative means we possess for various specific diseases, which depend upon the presence of a definite '*materies morbi*' in the blood, especially gout and rheumatism; as well as for that depressed state of the general system which results from the 'wear and tear' of the bodily and mental powers." Dr Carpenter here takes a very limited view of the true nature of the water cure. Safely can I aver that no system of treatment ever yet propounded to mankind is so well adapted for the cure of all really curable diseases, and for alleviation of those which are incurable, as is the great water cure.

To return to membranous absorption. There is so much to instruct and interest you in direct connection with the absorbent function of the three great organs already stated, namely, the lungs, the stomach, and the skin, that I must inform you respecting them. Their internal surfaces possess great power of absorption, although in very different degrees. That of the lungs is, indeed, much the most powerfully absorbing surface of the human body. This is established on different grounds. Firstly, on the ground of the very great extent of membranous surface which is formed by the air cells; and, at the same time, that the membrane itself which composes them is so delicate and so fine in texture. Again, a free communication exists between the branches of the blood-vessels of the lungs, both veins and arteries. Again, the lungs themselves are adjoining, or rather, in actual contact with the heart, so that the course of the blood from the minute vessels of the lungs becomes short



and rapid to the heart, which works the circulation. Moreover, the lungs are also adjoining the central masses of the nervous system, with which they have free communication through innumerable and large nervous branches.

If you duly consider these circumstances, you will see ample reasons why the different matters which are brought in contact with the internal surface of the lungs, are so very rapidly absorbed; and why their effects on the whole body are so severe and so instantaneous, when such matters are of a noxious nature. The circumstances just related also explain to us why any harmless fluids, which are brought in contact with the same surface in moderate quantity, should cause no more injury and inconvenience than when they are taken into the stomach.

You know well that when even a drop or two of pure water is brought into contact with the upper part of the trachea or windpipe, which has the same kind of membrane as that which forms the air-cells of the lungs, it immediately causes the most violent cough and disturbance. Let the same water, or even more, be placed on the internal membrane of the lungs, and it will be borne with comparatively slight inconvenience. You see a sufficient reason for this in the fact that in a short time the water will be removed by the membranous absorption of that internal lining membrane, and will be taken into the circulating mass of blood.

When poisonous matters are inhaled, and are thus brought into contact with the same membrane lining the lungs, their usual effects on the entire system are very soon produced. If a concentrated solution of strychnine be introduced by injection into the windpipe, death will be caused immediately. Again, concentrated prussic acid, taken into the lungs by a single inspiration, will kill in a moment of time.

Experience is constantly teaching us how great are the power and rapidity of membranous absorption in the lungs. The inhalation of the spirits of turpentine causes the peculiar violet odour of the urine much more rapidly than when it is taken into the stomach. And such is the case with other substances.

Above all, you must keep in mind that this internal surface of the lungs becomes the chief inlet of infectious diseases, as fevers of various kinds, and malignant cholera.

As remarked by Dr Southwood Smith, in his excellent work on "*The Philosophy of Health*:" "By the extent and energy of its absorbing power, it (the internal surface of the lungs) is one of the great portals of life and health, or of disease and death." The title of this work is very deficient; for it gives no adequate indication of the excellence, extent, and value of the information it contains on the anatomy and physiology of the human body.

The next great surface of membranous absorption is that of the stomach; and we must include also that of the intestines, so much concerned in digestion. This is not so extensive as that of the lungs, neither is it so near the centre of the blood circulation. Besides, a thick mucus adhering to it protects it from immediate contact with any substances introduced into the stomach and bowels. You can readily suppose, therefore, that it becomes less powerful as an absorbing surface; and that some poisonous or noxious substances taken into the stomach do not affect the human system so very rapidly. Such is the case. It is well known that certain poisons taken into the stomach require some time before they act on the system to destroy life. The medicines termed *emetics* usually commence their operation a short time after they have been taken. However, there is a difference as to the time of their operation, according to the nature of the emetic given. The same action would be produced by the emetic in contact with the membrane of the lungs.

Although this lining membrane of the stomach and bowels is less exposed and less rapid in its absorbent action than that of the lungs, it becomes frequently the medium of entrance of noxious and infectious matters into the system. This has been proved by experiments, and by the experience of many who have become the victims of disease introduced by this way.

The next and last great surface of membranous absorption to come under present consideration, is that of the skin. The

*epidermis*, or scarf-skin, you know, forms a protecting layer of insensible matter, which prevents the immediate entrance of matters from without, and regulates the passage of matters from within; it regulates the power of absorption and exhalation of the skin. You now see how it is that substances enter so slowly into the body through the skin, and why the deadliest poisons can remain in contact with it a short time without injury.

I have apprised you that the digestive surface of the stomach and bowels is protected, for a certain time, by adhering mucus, from the action of irritating and poisonous matters. You see, also, the appropriate nature and use of this covering of the skin. It is denser and more impenetrable; otherwise, how constantly should we be exposed to disease and death from contact with many matters which are thus rendered harmless. Many substances of this nature are of necessity much handled by different artists and mechanics.

At every stage of our physiological investigation we are arrested by the strongest proofs of Divine design, and of Divine care for our welfare and well-being. Callous and stolid in feeling must be the individual who can regard such wondrous work, teeming with most convincing evidence of perfect wisdom and goodness, without his aspiration of devout gratitude to Him who created man, and who gave to him a frame so exquisite in structure and beauty, and so well adapted for the purposes of life!

I now bethink me of the rather lengthy remarks and inquiries in one of your last letters respecting the prevalence of infidelity in the medical profession. Similar remarks have often been made to me by others; and as to the circumstance alluded to, it may be true to some extent. Nothing, however, can be more incorrect than the inference so frequently drawn from it, namely, that the studies and occupation of our profession have a tendency to make us infidels. No, Sir; the legitimate tendency of these studies, and of our daily occupation with disease and death, is most specially and strongly to fix the mind in adoration of the glorious attributes of God; to confirm it in

the belief of the truths of His inspired word, the Bible; and to make it grasp more firmly the glorious realities of Christianity.

The inference just alluded to would be a libel on the human intellect, and a contradiction of common sense. Allow me in explanation to assure you, that there is no sincerity or reality in the professed principles of infidels of any class of men. Depend upon it, it is not that they *disbelieve* the truth of the Bible and Christianity, but that they *dislike* it. Most apposite and true are the words of our blessed Saviour, as related by the evangelist John, iii. 20,—“*Every one that doeth evil hateth the light, neither cometh to the light, lest his deeds should be reproved.*” It is the simple fact of the natural and unconverted heart being at enmity with spiritual truth.

Take it from me, that there is no such thing as a sincere, real infidel, as commonly understood. It is ever a wilful delusion of the soul,—a shallow but desperate subterfuge, which the heart palms upon the understanding, in order to shirk the accusation of conscience and the sense of moral responsibility. A man may, indeed, proceed in such a course under the impression that he is sincere in his unbelief: but how can he be so whilst he remains so deplorably ignorant of the truths he professes to disbelieve? Again, the infidel principles of such men always forsake them at the testing time of a dying bed.

But I really feel great impatience whilst treating of this infidelity; it is something so very irrational. It is like the principle of a man who shuts his eyes, and then declares that there is no light from the sun at noonday. You have written at such length on it, however, and have inquired so fully as to my opinion respecting the infidelity of medical men, that I must make another observation or two. Believe me, it is the same unreal and hollow thing, by whomsoever it may be held and advocated. It is the flimsy shield which men resort to for protection in the downward course of an immoral life.

I have seen most striking proofs of the correctness of what I have just stated. I have often seen it in others; moreover,

I have had personal experience of it, in such a degree of severity as no language can describe. Oh, dear Sir, it is, indeed, a sad and severe pass to arrive at in the prospect of death, and truly a dread concern, when the guilt-stricken soul has nought to rest on but the struggling hope that death may be annihilation,—a being reduced to absolute nothingness, and to exist no more for ever! Let us be firm to truth, and honest with ourselves. As written by Robert Hall, "Religion is the final centre of repose; the goal to which all things tend; which gives to time its importance, and to eternity all its glory; apart from which man is a shadow, his very existence a riddle; and the stupendous scenes which surround us are as incoherent and unmeaning as the leaves which the Sibyl scattered in the wind."

Furthermore, the principles of the soul-delusion, termed infidelity, must have greatly injurious influence on the individual professing to hold them. Apart from the consequences which must endure for ever beyond the grave, they must, in this life, debase and desolate the mind. They must deprive this life of all its worth and joy, leaving, instead of these, a dreary, worthless waste, uncheered by those prospects and anticipations which make our present existence the spring-time of a glorious future. If you wish to contemplate a grand and comprehensive, a sublime and most truthful view of Christianity in contrast with everything else which men of this world call great and glorious, read "*The Martyr of Erromango*," the work of that master-mind, the Rev. John Campbell, D. D. It is published by Snow, of Paternoster Row.

To return. You must bear in mind that beneath this scarf-skin, this inorganic *epidermis*, there is a very vascular and sensitive surface on which absorption is carried on very rapidly. When poison is placed in contact with it, we very soon see the effects of its operation. If arsenic or strychnine be applied to an open ulcer, or to a blistered surface, death will be produced as soon as when they have been taken into the stomach. Inoculation of the small-pox or of cow-pox affords us a common instance in which the interfering power of the cuticle or scarf-

skin is avoided by inserting the matter of the disease beneath it with a lancet.

You must not suppose, however, that the scarf-skin entirely prevents the entrance of morbid matter by the skin; on the contrary, the skin is frequently the medium of infection, although not so much so as is the lining membrane of the lungs.

There are endless proofs and illustrations of the process of membranous absorption which I have not noticed. I have here treated principally of the three great surfaces. I have stated what I deem the most essential and needful to be known by you, that you may the more readily understand the remaining letters I have to address to you respecting health and disease. Before I enter on the task of further reply to your many inquiries, let me beg of you to consider well the concise account I have now given you of the function of absorption, in all its varieties; for it is assuredly very closely concerned in every stage of life, health, and disease. I must leave the subject for your meditation.

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## LETTER V.

SECRETION AND EXCRETION—CAUSES AFFECTING SECRETION—THE  
FIVE GREAT ORGANS OF EXCRETION—EFFECTS OF OBSTRUCTED EX-  
CRETION.

MY DEAR SIR,

THERE are two organic functions of the human body, of which I have not written to you. They are intimately connected with the chief subjects of these letters. In meeting with the names of these two processes non-medical readers are frequently puzzled to understand their true nature and different uses. I allude to *secretion* and *excretion*. I can only undertake, in my limited space, to make a few brief remarks concerning them, yet they will suffice for the end in view.

The word *secretion* is from the Latin word *seccorno*, to separate, to sever, to put asunder or apart. The entire matter of the human body is literally secreted or formed from the blood, which is formed from food, with the aid of air, water, heat, electricity, and light. These things have been repeatedly explained to you. But the term *secretion* is used in a more special sense, and is applied to certain matters, both fluid and solid, which are secreted or formed by certain parts of the body, called *secreting organs* or *instruments*. The principal ones are *glands* of various sizes, and for various purposes; and serous and mucous membranes, also, form extensive *secreting surfaces*, which perform functions of great importance to the health and well-being of the animal economy.

I must not forget to tell you that the word *secretion* was first used on the erroneous supposition that it was literally and only a *separation* of those different matters from the blood which existed in it. The truth is, that they are *formed* or *elaborated* out of its constituent elements. The liver secretes, or elaborates, or forms bile from the carbonised and impure venous blood, which is carried through it for the purpose. Again, the breasts of the mother secrete or elaborate milk from the nutritious arterial blood circulating through them for the purpose. The stomach, by the apparatus on its lining membrane, secretes the gastric juice. The kidneys secrete urine. The salivary glands in and around the mouth secrete saliva. The wax of the ear is secreted by a suitable apparatus on its internal surface.

All matters, both fluid and solid, which are produced to serve some useful purpose in the human body, are the products of secretion. And mark you, all matters which are separated from the body, to be removed as useless or noxious, are also the produce of *secretion*. But they are called *excretions*, because they are separated for the purpose of their removal from the system. *Excretion* is a particular form of *secretion*. The distinguishing difference between the two processes is, that in excretion the matter separated is either noxious or useless, and

must be removed from the body. The matter separated by secretion has to serve some useful purpose in the body.

I cannot explain to you the real nature or mode of performance of secretion; for, like some other things in the animal system, it is unknown. It is certainly performed by the joint means of arteries, veins, nerves, and absorbents. The chief agency is, doubtless, that of the *nervous power*, and may be of a modified kind for the purpose. Membranes become the seat of secretion, and we see a great variety of its products. The membranes which line the large and closed cavities of the human body are termed *serous membranes*, because the fluid which they secrete, and which preserves their proper and moistened condition, is *serum*. I mean the cavities of the chest and of the abdomen.

Again, there is the *synovial membrane*, which lines the interior surface of the joints, and secretes *synovia*, or joint-oil, a glairy fluid which is useful and necessary for locomotion.

Then, you must consider the most extensive membrane of the body, which is called *mucous membrane*. It lines the open cavities and canals of the body—the mouth, the stomach, and intestines: also the air passages, and the lungs. This mucous membrane secretes *mucus*, which adheres to its surface, and keeps it in a suitable state of moisture.

An Italian physiologist called Malpighi, and another called Ruysch, who flourished at Amsterdam at the same time, and Müller of Berlin, all these narrowly investigated the minute structure of the secreting apparatus, and formed certain doctrines on the nature and uses of secreting *sacs*, and *follicles*, and *tubes*: but they differed in their opinions. Nevertheless, it is now established that *follicles*, *cells*, and *tubes* constitute the principal apparatus of secretion, with some variety of arrangement of the same.

Sometimes the apparatus or means of secretion consists in simply extended membrane: and a fine network of minute or capillary arteries, nerves, and absorbents, is stretched over its secreting surface; and by the specific action of these the matter secreted is separated from the blood.



Yet you are to keep in mind, that there are the other forms of apparatus for the purpose; namely, *cryptæ*, or small pits; *follicles*, or small bags; *cæcæ*, or small pouches; *tubuli*, or small tubes; which also serve for retaining the matter for a while, to be supplied according to the wants of the system.

When these *cryptæ*, *follicles*, *cæcæ*, and *tubuli* are collected into close contact, and have their necessary arteries and nerves enclosed with them in a common membrane, and as one mass, they constitute a *secreting gland*. You are to consider a secreting gland as a collection of these secreting bodies connected by cellular tissue, and enveloped in a common membranous covering, and thus forming a distinct organ of secretion. Such are the liver, the pancreas, the spleen, and the kidneys.

There are many very interesting particulars in connection with the present subject; but my limited space allows not of further particularization. I must not leave it, however, without some notice to you of the extent of secreting apparatus. Think, that wherever nutrition is carried on, there, also, is secretion and its apparatus. The extent cannot be correctly stated. All the internal surfaces are studded with secreting bodies. The skin is covered with them for the secretion of insensible perspiration; also for that of the oily matter which gives to it its softness. But further, think of the great organs of the body, the liver, the lungs, the pancreas, and spleen: also the brain. Again, think of the organs of the senses, the eyes, the nose, the tongue, and the ears: nay, every point of the body, and even the bones, have innumerable organs of secretion.

The great and indispensable agent in this process or function of secretion is *organic nervous power*; this is undoubted. Just in familiar illustration of the fact let me call your attention to what you are already aware of. You know that the sight, and even the thought itself, of agreeable food, fills the mouth with a secretion of saliva; in common parlance, it *makes the mouth water*. Again, music, or agreeable society at dinner, or other meal, increases the appetite, and favours digestion. You well

know, and I well know from experience, that disagreeables of any kind, affecting the mind through the brain and nerves of animal life, and through these, the nerves of organic life, destroy the appetite of the most hungry man: the secretion of gastric juice is excited by the causes of agreeable kind, whilst it is arrested by the contrary.

Again, you well know that grief causes a flow of tears, in other words, it causes an increased secretion of tears by the lachrymal glands. Fear will cause an increased secretion of urine, and an inability to retain it. Often have I known the fine maternal feelings which bind woman's heart to her offspring, called into active exercise by the cry of her child! That cry, or the sight of her child, will at once fill her breasts with milk. Nay, it is a well-known fact that the woman of strong maternal feelings has had the secretion of milk produced by an infant's cry when she has heard it in after years, and long past her own period of child-bearing.

The imagination can affect secretion. Dr S. Smith mentions the case of a female who had a great aversion to calomel. She was taking it in minute doses, unknown to herself. She was told of it, and was immediately salivated. On being persuaded that she had not taken any, the salivation ceased. Again she was told that she was taking it, the salivary glands were again excited to excessive action and salivation. In proof that it was purely the work of imagination, there was no redness of the gums or swelling of them, which always is the case in the action of calomel.

Allow me to conclude this very interesting subject of *secretion*, to which your earnest letters have led me, by a few remarks on another point which crosses my mind regarding it. I cannot give you any satisfactory explanation of the fact. But how is it, that from the same vital fluid, the blood, the same kind of secreting apparatus produces the secreted matters according to the specific purposes to be served by them, and produced, too, by the same nervous power? How is it, I mean, that the breasts of the mother secrete the bland and-nutritious fluid called *milk*, which is so suitable for infancy, and not

another fluid? How is it that the liver secretes bile, and not urine? or how, that the kidneys secrete urine, and not bile? and so on. These belong to the *arcana*, the secret things of animal organization, which no human mind will ever penetrate. However, in reply to such questions, we may point to a difference of structure or texture of those several organs of secretion. Nevertheless, there is a cause which is, doubtless, beyond the ken of man. We see enough, however, to fill us with adoring admiration of that wisdom which is infinite, and of that design and beneficent care which incessantly provides for the welfare and well-being of man.

We must now take a very brief consideration of the other function, namely, *excretion*. I have already informed you that this is only a particular form of *secretion*. Different matters contained by organized bodies, both vegetable and animal, are continually thrown off by them to enter into other combinations, and to constitute part of the matter of the external world around us. Such rejected matters of the human body are called *excretions*. The function for the purpose is that of *excretion*.

I must aim at the strictest brevity in treating of this form of secretion. I keep in view the essential points in closest connection with the chief subjects of these letters. I aim at a statement of such things as will best explain these to your non-medical mind.

There are five organs belonging to the human body, which may be said to be decidedly *excretory* in their functions; that is, which serve the purpose of separating those matters that are termed excrementitious, and become noxious to the body if they be retained beyond a due time. These organs are *the intestines*, *the kidneys*, *the lungs*, *the liver*, and *the skin*. You know quite well that they have other purposes to serve; yet, this one of *excretion*, for the removal of improper matters from the body, is a very important one.

I need not describe to you the minute anatomy of the skin; but really, I cannot easily overrate the importance of its different functions, and more particularly those of *excretion*, for

which its structure is well adapted. I just remind you that it is composed of three layers or coats—the internal one is called the *cutis vera*, or true skin, of which I have already treated. The middle layer is called the *rete mucosum*, or mucous network: it is most conspicuous in the negro, in whom it becomes the seat of colour. On the external surface of the *cutis* there is a particular and complex network of blood-vessels, nerves, and absorbents. These nerves are of two kinds, both *organic* and *animal*, that is, *insentient* and *sentient* nerves. The *organic nerves* give power to the arteries to perform their part in the functions of the skin, and these are chiefly of an excrementitious nature. The supply of *animal nerves* to this *vascular plexus* of the skin gives to it its fine sensibility.

I mentioned to you before, that the softness of the skin is owing to the oily matter which the *sebaceous glands* secrete for the purpose; and on this oily substance depends the odour of the animal body. This odour becomes variously strong and very peculiar, in certain states of the nervous system. I have known it more particularly affected in the *insane*. But there are certain grounds for supposing that this odour may be various in its quality, beyond our power of conception. I am thinking of the dog, the faithful but often ill-requited companion and friend of man. You know that he at once distinguishes the odour of his beloved master amid the crowd of thousands. He distinguishes by his nose where is his footstep, be it in the crowded city or on the public road.

I wish you especially to keep in mind that the skin is highly furnished with blood-vessels and nerves, and that it performs most important functions. It performs, at least, four; three of which are *organic*, and one is *animal*: namely, *secretion*, *excretion*, *absorption*, and *sensation*. The last mentioned is the one *animal* function which the skin performs, and which serves, as you know, most necessary purposes.

The principal excretion of the skin is that of the *perspiration*. This is both *sensible* and *insensible*. The former is commonly called *sweat*, the latter is invisible; but it is constantly going on, so that a great amount of matter passes, in this way, out of

the human body every day. You are aware that the sweat, or visible perspiration, is the great means of regulating the heat of the body when it is exposed to a high temperature, especially in tropical climates, and in the hot summer weather of our country. The evaporation of the fluid perspired is a cooling process.

You must not forget that *carbon* is constantly separated or excreted by the skin from the blood; and thus, you perceive, that in this action it aids the lungs in their great process of depuration or decarbonization. Remember, however, that another great office of the skin is to relieve the blood of its excess of water, of which *hydrogen* is the chief element. You see, then, that the three great organs for depurating the blood of carbon and hydrogen are, the lungs, the liver, and the skin. They are closely connected in function, so that, under certain circumstances of climate and habits, they become vicarious, that is, they act for each other.

Let me fix your attention on the extent and importance of the functions of the skin; and especially on the great fact that this extensive organ of *four functions* is the very appropriate field of operation of the *water cure*. No wonder that this has proved the most efficacious of all curative means ever practised against the diseases of the human body.

The lungs, you are aware, are the chief decarbonizing organ of the body. The venous blood, with which are commingled the chyle and lymph, is the carbonized and impure blood which enters the right side of the heart, and by it is sent to the lungs, where the process of decarbonization takes place, through contact with the oxygen of the air inhaled. It is returned from the lungs to the left side of the heart in the character of *arterial, oxygenized, and vitalized blood*. It is then sent by it into all parts of the body.

I have already mentioned to you the *elective power* of the lacteals. Certain matters which had been rejected by these lacteals are taken up by the veins and absorbents of the adjoining parts, and are conveyed into the blood which goes by the large vein called the *vena portæ* to the liver. Now, by the appropri-

ate function of the liver these matters undergo a further and perfect digestion. After this, they are conveyed by a short course to the heart, and thence to the lungs for their assimilation to the nature of arterial blood.

The liver is an organ of excretion, as you now see, for the substances called carbon and hydrogen, the chief constituents of bile; and they are highly excrementitious; and the more copious the quantity of bile secreted, the larger the amount of carbon and hydrogen taken from venous blood. Thus, as stated before, the liver is greatly auxiliary to the lungs and the skin in their work of *excretion*, and of necessary depuration of the vital fluid, the blood.

I have next and but briefly to notice to you the excretory functions of the kidneys. They have nothing to do with the excretions of the liver, the lungs, and the skin, as far as *carbon* is concerned. The kidneys, you know, secrete the urine. According to the various circumstances of the human system does the quality of this secretion vary in its composition. The special office of the kidneys is to eliminate or extract the highly animal substance called *azote* or *nitrogen*. This, you know, is an elementary ingredient, and a principal substance of their excretion from the body, but not the only one. They have, indeed, a certain relation in their function to that of the skin, in the *watery fluid* which forms so large a part of the urine, and this is always in the inverse proportion to the quantity taken from the system by perspiration of the skin.

Many different kinds of salts and other matters are to be found in the urine by chemical analysis; but I need not mention them here. The chief matter which characterizes its composition is called *urea*, which is of a highly animalized nature, and the constant excretion of which cannot be interrupted for any length of time without the most injurious and even fatal results.

The function of the kidneys appears to be the occasional outlet for whatever is not needed in the animal system; and whatever is not of a suitable quality for a passage by the other

organs of excretion, or does not find its usual and proper outlet. Often does the bile pass in the urine when its usual passage into the bowels is stopped by disease. The special matter of extraction, I repeat, is *urea* as a proximate principle, and the special elementary substance is *nitrogen* or *azote*.

We will now briefly consider the object or purpose which is served in the human body by the function of *excretion*. It is soon stated. You are aware that the grand source from which are derived the materials of the body's composition, is the blood. It becomes a matter of great moment that this vital fluid be preserved in a state of purity, and adapted for the great purpose of supplying the various tissues, and for the purposes of life and organization. A wrong condition of the blood, by the retention of any matters which ought to be continually removed, becomes rapidly injurious and even fatal to life.

*Excretion* is the great depurating process of the blood. Firstly, that of the lungs cannot be at all suspended without the worst consequences, which are immediately experienced. The carbon of the venous blood, which ought to be extracted by its combination with the oxygen of the atmospheric air inhaled, quickly accumulates, and mixes with the arterial blood. In a minute or two the arterial blood becomes venous, and being carried to the brain, sensibility is first destroyed; then the heart ceases to act, and death ensues. Such is the case in death by hanging, and drowning, and all similar means by which the function of respiration and decarbonization is interrupted.

Again, if the proper excretion of bile by the liver be stopped, it soon accumulates in the blood, and its evil properties are experienced in the extreme depression of nervous power. If the usual excretion be not soon reëstablished, more serious consequences will follow.

I have next to apprise you, that if the excretion of *urea* by the function of the kidneys be interrupted for a short time, the blood is thereby rendered putrescent; and very soon the most malignant fever destroys the individual; coma, or stupor, and death are the result of its retention in the vital fluid. This is

occasionally seen in the course of certain diseases, and becomes the cause of their fatal termination.

Further, in regard to the excretion of the skin. You are aware that the internal and external covering of the body, that is, the skin and the mucous membrane lining the mouth and intestinal canal, are identical in structure and character; and that the whole difference of their appearance is owing to their difference of position. Hence the close sympathy between them. When the excretion of the skin is suppressed, the internal organs suffer immediately.

As to the excretions of the intestinal canal, and the very injurious effects of their suppression, I need not inform you. Such is the importance of a constant and due action of the bowels, that purgatives become a chief means of allopathic drug medication: and when judiciously administered, they are decidedly the most effectual.

When the function of excretion is duly performed by the different organs for the purpose, all is well with the human body. The blood continues pure and healthful in its influence on every organ, and is suitable for the great purposes of life. When all is healthful and well with the body, and only then, does it become the suitable tenement and the efficient organ of the soul; to obey its high behests, and to answer its great purpose of devotedness to the service of the infinite and adorable Creator. Do remember the imperative necessity of preserving the health and vigour of your body, if you wish fully to enjoy the only happiness to be found on earth,—the happiness of a life devoted to the glory of God.

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## LETTER VI

DEFINITION OF LIFE AND HEALTH—CONTRACTILITY AND IRRITABILITY  
—CIRCLE OF INFLUENCES—CORRECTION OF COMMON ERRORS IN DIET  
—LIST OF FORBIDDEN ARTICLES OF FOOD FOR PEOPLE OF SEDENTARY  
HABITS—SLEEP, &C. &C.

MY DEAR SIR,

I TRUST that I have now put you in possession of a sufficient knowledge of the organs and functions of the human body, to enable you to understand and appreciate what I am about to state for your consideration on health, disease, and its treatment. I must aim at all possible brevity; therefore, I shall mainly state to you what I deem fundamental principles, with the most interesting and prominent facts which may serve to explain them.

Life has been defined by different authors. I think you will most easily understand the definition of Dr Fletcher, a very talented and excellent physiologist of the Edinburgh school of medicine, when I was a medical student there. "*Life*," says he, "*consists in the sum of the characteristic actions of organized beings performed in virtue of a specific susceptibility acted on by stimuli.*"

Now, from this I present to you a definition of health, which you can well understand,—that it consists in the perfect performance of those *characteristic actions of organized beings*, especially in regard to digestion, blood-making, and nutrition, which are specially necessary for their continued existence. The *stimuli* in Fletcher's definition are the physical agents, which are also specially necessary for organic life. For that of the plant they are air, water, heat, electricity, and light.

For the maintenance of human life in health and vigour, in our climate at least, a more elaborated food of vegetable and animal nature is necessary; and the needful physical agents are included in *wholesome diet, pure air, and exercise*, with *light* and

*electricity*, also *pure water internally and externally applied* ; and there must be superadded the *due exercise of the mind*.

I wish you particularly to bear in mind that *organic nervous power* is the primary agent of animal life and health, and that the causes which act most powerfully to injure or diminish it, will prove the most productive of disease.

You have earnestly desired me in your last letter to instruct you further on the fundamental principles of health, disease, and its treatment ; and your questions respecting them, in connection with the water cure, bespeak your anxiety to learn, of which I am glad. I have just stated to you above what constitutes health, and I have now to state that the contrary means and condition cause and constitute disease. But more particularly in regard to Fletcher's definition.—It becomes necessary for the continuance of health, that the specific *susceptibility* be in a correct state ; and that the physical agents to act on it be also of a correct quality and degree. These physical agents have been stated in relation to the human system to be wholesome food, pure air, bodily exercise, water internally and externally, electricity, and light, with the suitable exercise of the mind.

Of course, there are certain organs and functions associated with the physical agents just mentioned. Now, in connection with the same organs and functions there are two specific properties, termed *contractility* and *irritability*, or *sensibility*, which belong to them, and which are provided by the organic nerves : they are, therefore, termed *organic contractility* and *organic irritability*. The last mentioned is the *susceptibility* of Fletcher's definition, and to be acted on by the physical agents. This susceptibility, irritability, or sensibility, is of a very special nature, and beyond the power of human intellect to perfectly comprehend. Its precise quality is adapted to the function of each organ : namely, the irritability of the eye is susceptible of the influence of light, but not of sound ; again, that of the ear is susceptible of the influence of sound, but not of light.

Further, the irritability of the heart responds to the stimulus of blood ; and that of the stomach to the presence of food. You must further consider that each part of the intestinal canal pos-

sesses its own *organic irritability*, which answers to the stimulus of its own contents only. Remember, that in health this *organic irritability* is without the sensation or feeling of animal nerves. It is without the consciousness of the individual. As I remarked before respecting this point—how wise and how beneficent is this adjustment !

I must next explain to you that the *contractility* of the organs of the human body constitutes their power of action on the application of the natural and suitable agents. It is the power of the organic action of the various organs ; that is, of the heart to circulate blood, and of the stomach to digest food ; and so on of the others.

Now, I have to beg of you to keep in mind that this organic property of *contractility* becomes strong and energetic in proportion to the *freshness* or *newness* of the component matter of the human body. Do understand me, that in proportion to the rapidity of the *change of tissue*, will be, of course, the newness or freshness of that tissue ; and this *contractility* of the organs will be strong and energetic in like proportion. In illustration of this point I may mention, that in people of advanced life the *change of tissue* goes on more slowly ; and hence the *contractility* of their organs is diminished ; in other words, they become feeble and without energy. On the contrary, in children and young people the tissues are rapidly changed ; hence their increased *contractility*, and their proportionate activity and vigour. We have a proof in the known effects of air and exercise : they cause more rapid *change of tissue*, and the consequent increase of muscular power.

You must keep in remembrance that vigorous organic contractility, with a proper degree of irritability of the organs, and with the due application of the physical or natural agents, are the essential conditions of health. I wish you also to keep in mind, that the organs and their properties and functions constitute the *circle of influences* before alluded to.

We must firstly have in this circle the organic nervous power, consisting of *contractility* and *irritability*. Of the organs the chief ones are those of digestion and nutrition, including, of

course, those of respiration and circulation of the blood. In inseparable connection are also the organs of absorption, secretion, and excretion. These belong to organic life. There are also the brain and animal system of nerves, and the organs they supply for the purposes of animal life, which are also in inseparable connection, and belong to the circle of influences concerned in the condition of health.

You can well comprehend that when all the organs and functions of this said *circle of influences* are under the due operation of the physical agents, namely, proper food, pure air, and exercise, with electricity and light, and of pure water internally and externally applied, with the proper exercise of mind; when all these are proceeding vigorously and harmoniously, a perfect condition of health becomes the happy result.

My space will not permit that I treat at any great length and separately on these natural physical agents. But you, dear Sir, must now be quite competent in judgment to estimate the nature and importance of every one of them for the preservation of health: the necessity of proper diet, as to both quality and quantity of food, for the perfect performance of the digestive function:—also, how necessary are pure air and exercise, especially for the functions of respiration and circulation of the blood:—how necessary, also, the due supply of electricity and light. Moreover, how all-important becomes the constant supply of pure water for internal and external use. And, how much the well-regulated exercise of the mind has to do with the preservation of health. Of these points I am about to treat concisely, and to give you what I think the most necessary information.

In one of your last letters you very earnestly request of me to furnish you with special directions for the preservation of health; but I really cannot suppose that you will need much instruction, in addition to what I have already stated on the fundamental principles of it. However, I will make a few more observations, which, with the preceding ones, will amply suffice.

Let me impress strongly on your mind that the chief objects of your care for the preservation of health, should be to preserve

the primary and secondary means of it in the most vigorous and perfect condition : these are, the organic vitality, or nervous power, and the functions of digestion, blood-making, and nutrition, of which it is the efficient agent.

Such a condition will secure the rapidity of *change or renewal of tissue* : from this you will have that *newness* and *freshness* of the entire structure of the body, on which, I say, ever depend the vigour and power of nervous energy : this will react on the entire organism of the system. You clearly perceive what I mean by the *circle of influences*.

Let us return for a moment to the starting point of *the circle* ; I mean *organic nervous power*, and the *digestive function*. For the most perfect performance of the functions of the stomach, and the other organs concerned in digestion, your great care should be to take proper food as to both *quality* and *quantity*. Avoid all indigestible articles of diet.

I now give you a list of the articles of food which I consider indigestible, but you must understand this in relation to the digestive power of a certain class of individuals for whose benefit I more especially write these letters. I keep in view the ministers of the gospel, literary men, and those of indoor and sedentary occupation. What I am about to state for their and your guidance applies not to the agricultural labourer, nor to the hunter. There are many articles of food that are in common use amongst mankind, but which are properly included in the list of the unwholesome and forbidden to the studious and sedentary. Let me observe to you, that although such things may be constantly taken by healthy and robust out-of-door people, and without any ostensible injury, this cannot alter the fact of their comparatively indigestible and injurious nature.

There are certain erroneous notions which I frequently meet with amongst my patients, and by your last letter I find that you are not free from them ; therefore I shall firstly and briefly correct them. You say that you are surprised that in my few allusions to diet in a former letter to you I did not mention the *wholesomeness* and superior quality of *brown bread*. True enough, too, you say that it is an article of food so much used,

and more agreeable than *white bread*. Moreover, that the great *Liebig* has written very favourably of it, and that according to his opinion and the judgment of other great authorities, the sooner it supersedes the use of all other kinds of bread the better for all its consumers. Now, in reply to all this I confidently state to you, that sound and well-baked *white bread*, and without any admixture of the *bran*, is the *most wholesome* of all kinds of bread for the human stomach. No doubt, your favourite *brown bread* may be wholesome and agreeable for strong and healthy people of out-door lives; but I know well that I am telling of the personal experience of thousands of individuals when I also state, that with people of weak digestive organs, or of sedentary habits, it does not agree. I have long known from numerous patients that the use of *brown bread*, even of the best quality, becomes a constant cause of *heart-burn* and *flatulences*; and that it tends to increase dyspeptic or stomach complaints. Very frequently have I had to forbid the use of it to such patients, and always with the best results. They have almost always assigned as a reason for using it—that it acts on the bowels, and thus supersedes the use of aperient medicines. But it is also a proof of its comparatively indigestible quality.

There is also another incorrect argument, and brought forward more recently for this *brown bread*, on the ground that *Liebig's* analysis has proved that the *bran* which it contains is very nutritious, and specially adapted for the supply of material for certain tissues of the human body. This proof cannot avail for any purpose, because it is also proved by experience that it is the *bran* which acts on the bowels: it is therefore not digested, but passes through them unchanged, as can be often proved by an inspection of the discharged contents of the bowels. Remember, *that no constituent of food can be at the same time both aperient and nutritious*. The same thing takes place in the internal use of *currants* and *sallads*, and other comparatively indigestible articles of food, which, in fact, the innate irritability of the stomach and bowels hurries through them, when they are not of sufficiently improper quality to cause

their detention in the stomach by the pylorus or door-keeper at the lower opening, or to cause their ejection by vomiting.

Let me here warn you against a common error, and which has been often committed even by medical authors, in reckoning in their experiments on the *comparative digestibility* of food according to the quickness of its passage through the stomach and bowels. It is an erroneous notion, and you must not entertain it in respect of your favourite *brown bread*, nor of other articles of diet. As a law, and as just remarked by me, it is not the *digestible* but the *comparative indigestible* nature of the food which hurries it through the alimentary canal. The late excellent surgeon, Sir Astley Cooper, made a mistake of this kind in his experiments with pork which he gave to dogs, and he concluded in its favour, for the reason which ought to have made him pass an opposite opinion. And Dr Beaumont of America, in his many experiments with the celebrated San Martin, who had a large hole in the front part of his stomach, made by a musket shot in battle, and who survived it many years. Dr Beaumont was wrong in his decision on different articles of food, through the same mistaken notion, against which I have warned you.

You have now got my opinion of brown bread, and I am glad that you have called my attention to it by your last letter; for I know that it has become a kind of fashion to talk and write in commendation of it, and in disparagement of more wholesome food. There are also other crude notions abroad about the so-called *unsophisticated food*; and countenanced, too, by some medical writers who ought to know better. Some individuals I have known who go even further, and not only make use of bread without any separation of the bran, but made, too, without yeast or leaven, in order to have the thing *most natural* and *unsophisticated*!

By your last letter I see that you entertain another erroneous notion which needs correction. You think highly of *lettuce*, and all kinds of *sallads*, and *celery*, as cooling to the blood, say you—and very wholesome. Further, you suppose, that *radishes*,

and *horse-radish*, and *mustard and cresses*, and such like, are *good stomachics*, and *very wholesome*? Decidedly I answer that they are not of the quality you ascribe to them. Take it as my reply to your many queries about the comparative wholesomeness of many such things, *that all raw or uncooked vegetables*, be they *salads* of whatever kind, or so called *stomachics*, or what not, are of *unwholesome* quality for the human stomach. Fruit, even, becomes far easier of digestion after being baked or roasted. The truth of this statement becomes more evident when such articles of food are taken by people of weak digestion, or of sedentary life. When *raw or uncooked* they cause indigestion and suffering, whilst in a baked or cooked state they can be taken with benefit and comfort.

I have to proceed in my warning to you against the articles of food which belong to the catalogue of *the unwholesome and forbidden* for individuals engaged in intellectual labour, and of indoor and sedentary occupation. Of such things are all kinds of *fish* abounding in oily matter, or having a texture or quality of flesh which I consider unsuitable as food for such persons. Such are eels, salmon, herrings, sprats, and mackerel. Also all salted or pickled fish, and all shell-fish. Of fowls, I warn you against the flesh of geese and ducks. All smoked and dried flesh of any kind. Also sausages of all kinds. Against all unleavened or heavy pastry—pies and cakes. Again, against your old friend, *brown bread*; and I say again, against all raw or uncooked vegetables, be they your *cooling salads*, or *celery*, or your *stomachics* of mustard and cresses, horse-radish, radishes, onions, and the like. I include also all unbaked or unroasted fruit, excepting, only, certain tender kinds, and when quite ripe, and in moderate quantity, as grapes, figs, gooseberries, strawberries, of our own climate; with others of other countries, as oranges.

Condiments of all kinds are very properly prohibited in the diet of water patients at hydropathic establishments; and for health and for natural and genuine vigour of both body and mind, let them be in the list of forbidden things in your diet. The most common are mustard and all kinds of peppers—



cayenne, ginger, and mace, cloves, and cinnamon. I must include all sauces for fish or game, as prepared and sold by those who get money by the folly of their fellow-creatures which makes them sacrifice their health on the altar of luxury and sensuality.

In addition to the things already mentioned, I must add to the catalogue of forbidden and unwholesome for the intellectual and sedentary man all the other provocatives of flagging appetite which are so often resorted to by the sensualist, but of which the hale and vigorous have no need, and from which the studious had better entirely abstain. Besides those already specified, I add the various kinds of *pickles*, and catsup; and, lastly, I earnestly advise you to always abstain from all kinds of beverage but those of water, and milk, and weak black tea. Avoid, as a very great evil, that accursed enemy to domestic peace and happiness, *alcohol*—which is ever so destructive of health, and lurks in spirituous, vinous, and malt liquors; avoid also strong coffee, and green tea.

But I am quite confident that error in diet is far more frequently in respect of *quantity* than of *quality*. *The people of this country, especially the middle and higher classes who are not engaged in manual labour, usually eat far too much.* However, this point of *quantity* will necessarily depend on the amount of bodily exercise taken, with other collateral circumstances.

You cannot easily overrate the importance of diet and exercise: and recollect, that they are to be regulated in proportion to each other. I will remark further on exercise by-and-by. At present let us proceed a little further on the *quantity* of food most proper, and most conducive to health and vigour of body and mind.

In plain parlance, I hold that for such people as you and myself, who belong not to the labouring class, three moderate meals a day are a full allowance of food. I mean by the word *moderate*, that after each meal the appetite should remain *considerably short of being satisfied*; and much further from it after the *LAST* than after the previous meals. Never fully satisfy your appetite at any meal, and the digestion of it will be

in every respect better. The body is not benefited by food in proportion to the quantity taken into the stomach, but only according to that which is perfectly digested. I must state to you my own conviction, that for such as you and myself *two meals a day instead of three will be by much the best for health and vigour of body and mind.* Indeed I know it from long experience; for almost ever since boyhood my rule of diet has been two meals a day; and every time of exception, in taking a third, has been invariably attended by a diminished state of bodily and mental health and vigour.

I can safely advise you *to avoid suppers.* This is invariably my advice to my patients. Whatever modification of diet may be rendered necessary by particular circumstances, I know of none which can make necessary and wholesome the habit of taking supper before retiring to bed. *Always go to bed with an empty stomach;* and keep in mind that *sleep is the appointed means for restoring the nervous energy* which has been expended during the day. Although organic life is never entirely suspended, sleep is the grand means of restoration of power to the organs of the body and mind. I need not specify particulars; we know that respiration and circulation are continued during sleep, and some other minor processes, but with diminished activity. Undoubtedly, the usual time of sleep in the night is very unsuitable for the active performance of digestion; and, assuredly, its organs require rest and cessation from functional labour, and ought to have it *especially at that time.*

The sleep of those who indulge in suppers is not of that refreshing kind which is enjoyed when the hard-wrought stomach is at rest. You will find, too, that when the stomach has had perfect rest during the night of sleep your breakfast will be, as it ought to be, the most enjoyed meal of the day. Again, you may consider it as a certain proof of imperfect health when you do not enjoy your breakfast. During my long practice in stomach complaints I have found it the most common circumstance of dyspeptic patients that they chiefly desire to eat at bedtime. Depend upon it, the indulgence of

that desire becomes one of the most effectual causes of prolonging the disorder of the stomach.

I know that many ministers of the glorious Gospel, who preach on week-nights as well as on the Sabbath, make a great mistake in taking suppers after their labour in the pulpit. I know well that they are frequently urged to it by the kindness of friends with whom they may have their temporary abode. Frequently, also, they have walked some miles to their work; and a sense of fatigue after sermon, with, perhaps, a somewhat urgent appetite, plead strongly but wrongly for supper. Let such remember, *that sleep is the only legitimate restorer of nervous energy; and that food is for the supply of the waste of the tissues.* Again, a demand is always made on the nerves for the digestion of food. You see, then, that at bedtime, when the brain and nerves are in the most exhausted state, it must be improper to take food for that purpose which is best and most naturally answered by sleep.

Your time of sleep should be regulated according to the labours of the previous day. The average length of time for non-labouring people is six hours in the twenty-four. It is not an easy matter to fix the necessary length of time for sleep; it is so much affected by constitutional causes and other circumstances. Yet, each individual may find out how much is really necessary for himself.

Avoid soft feather-beds, as a relaxing and injurious luxury; and always sleep on a mattress. When your body and mind do really need "*the sweet restorer, balmy sleep,*" you will not need the help of feathers and softness to secure it. As wrote our great bard of Avon—

"Weariness

Can snore upon the flint, when restive sloth  
Finds the down pillow hard."

In the matter of sleep, let me warn you against the highly-injurious custom of having *curtains* to your bed. It is bad altogether, and ought never to have been in use. It necessarily keeps a polluted and unrenewed air around the sleeper. In-

stead of this it would be well to keep up a constant supply of fresh air during the night, by having the window partially open. Remember, that under every circumstance of life ventilation has the strongest bearing on health; and the want of it is equally concerned in the causation of disease.

A point of great moment in connection with sleep is that of the quantity of bed-clothes, which should be as small as possible, to avoid the great evil of much covering whilst in bed. In connection with this is a point of physiology I have not told you of, and which is seldom thought of by non-medical persons. It is the explanation of the fact that you will be much more refreshed by sleep with light covering of bed-clothes than with the contrary of much covering. The functions of the skin will proceed much more actively, and insensible perspiration, or even sweat, will be produced much more readily with moderate than with much bed-covering. There is, of course, a certain quantity necessary; but beyond this it will be injurious. That correct quantity, remember, is at the point at which the innate organic nervous power is exercised to preserve the animal heat, and with it the functions of the skin which depend on its existence. It is the same power which causes the reaction of the skin after a cold bath, or a shower bath, or a copious draught of cold water.

Now, if you heap on you many blankets whilst in bed there is no call made on this organic nervous power to act. You may, indeed, be warm or hot beneath them, but that heat will be of an oppressive nature; and if you do perspire, it will be debilitating, and not the same kind of perspiration caused by the action of organic nervous energy. Think of this, and never burden yourself with bed-clothes, nor with excessive clothing of your body. It is not generally known that the matter of perspiration differs greatly in its quality according to the means which produce it. I noticed this particularly in my practice of the water cure at Malvern. The sweat or perspired matter from violent exercise differs greatly from that which is produced by the sweating processes. The state of the nerves has

also great influence in affecting the quality of sweat. These things become a very important consideration with the intelligent hydropathic practitioner, and lead him to select the most appropriate means, according to the requirement of the cases under his care.

I warn you against the idle and very relaxing habit of remaining long in bed in the morning, and after the needful and sufficient hours of sleep. You should be up at early morn, and you should then take your early sitz bath of five or ten minutes; and after it the invigorating wet-rubbing sheet; and be out and off to the hills, and inhale the invigorating morning air. Your time and circumstances enable you to do this; and you will be greatly benefited in doing it; and every one with the same means and opportunity ought to do it.

Early rising is greatly conducive to health; and where it can be practised, the habit of an early bath, and after it an hour's walking exercise, are powerful means for the preservation of health; and in very many cases for its *restoration*, when it has been sacrificed by habits of luxury and indulgence. There is a certain loveliness, and a salutary or even *curative* influence, in the morning atmosphere far beyond that of any other part of the day. I am disposed to believe that there is an *electric state* of the morning air different from that of the other periods of the day. At all events, it becomes luxurious and healthful to a high degree, to practise the habit of *early rising*, *early bathing*, and *early walking exercise*, according to the circumstances and opportunity of the individual. The bath or water process should be regulated according to the age and strength. For those of sufficient bodily vigour I would recommend the *sitz bath* of five or ten minutes; and immediately after it the *wet-rubbing sheet*. The *shower bath* is also an excellent process on rising from bed at early morn. The *shallow bath* is also very beneficial for the purpose of preparing the body for an early walk. For those of less bodily vigour the *wet-rubbing sheet* will suffice. *Sponging* the whole of the body on rising from bed has become a common practice; and it is, no doubt, of the

greatest service to many. Whatever process be used, the salutary effects are greatly increased by the walking exercise afterwards.

This brings us to a more particular consideration of the subject of exercise as a means of preserving health. That you may duly appreciate the correctness of the few following observations, I beg of you to recollect what I have already stated respecting *organic vitality, digestion, and nutrition*; and especially respecting the *rapidity of change of tissue* for the *newness and freshness of organic nervous tissue*, and for the consequent vigour and energy of organic vitality. You perceive at once that the functions of respiration and circulation become an effective cause of that nervous energy on which they themselves depend for their performance. This is in accordance with that *circle of influences* which reciprocally affect each other, and which have ever a mutual dependence on each other's well-being.

It is not sufficiently considered by many how directly the regular exercise of the body bears upon its health; and upon that of the mind also. I am thinking especially of many ministers of the Gospel and of literary men, who ought to better understand and appreciate its value. You surely now perceive how indispensably necessary walking exercise becomes for the right performance of the chief functions of the body—those of respiration and circulation of the blood; for the inspiration of pure air for the decarbonization of venous blood exposed to its influence in the lungs; and for changing it into the arterial blood, which is propelled by the left side of the heart to all the tissues of the body for their transformation or renewal.

Allow me, dear Sir, to impress upon you the important fact, that the mental and moral faculties of man are greatly dependent on the condition of bodily health and vigour. No doubt, the grace of the ever blessed God is sufficient for all things of this life: yet, the same all-wise Being, who deigns to bless with His grace, has also appointed a certain instrumentality of physical, mental, and moral agency in closest

connection and relation to each other. It becomes our duty to obey the laws of our physical, mental, and moral constitutions. Dr Reynolds, of Boston, U.S., says truly that "*disease throws a chain around the mind which the latter by its own unassisted endeavours cannot burst asunder.*" And again, "Ill health is equally unfavourable in its effects on the heart. Piety is affected by the animal spirits, and the spirits will and must flag when the body is diseased. It is the medium of communication for the soul with outward things. When that medium is disordered no object is presented in its true colours—nature to such a man has lost its beauty; 'the heavens are clothed in sackcloth, the earth is dressed in the garment of mourning.' We daily see instances of this melancholy fact. They speak, too, from the grave."

You now see how effective for the important purpose of health must be active bodily exercise. It promotes the various functions of organic life—those of absorption, secretion, and excretion, which I have already explained to you. It is most effective in hastening the disorganization or waste of tissues: and you are now prepared to comprehend the mode of its operation; that by increasing the rapidity of breathing, with that of the blood circulation, it necessarily increases the inspiration of the oxygen of the air, and hastens its combinations for the purposes repeatedly explained to you; and eventually for the newness and freshness of tissue, on which the health and vigour of body and mind so much depend.

Lastly, in regard to walking exercise, let me impress your mind that the earlier the hour of the day at which it is taken the better. When the bodily strength admits of it, let as much as possible be taken before breakfast. The time between breakfast and dinner is that at which the bodily strength is really the greatest for this or for any other kind of exercise of either body or mind. Therefore, when the low state of bodily power is insufficient for earlier exercise, let it be taken after breakfast.

## LETTER VII.

DISEASE, WHAT IT IS AND WHAT IT IS NOT—CAUSES OF DISEASE—  
CIRCLE OF INFLUENCES—MAL-NUTRITION OF NERVES—UNEQUAL DIS-  
TRIBUTION OF BLOOD, &C. &C.

MY DEAR SIR,

I MUST now proceed to instruct you respecting disease. I need not waste words in repeating to you the various definitions of it to be found in the works of medical authors. I may safely conclude at this stage of our correspondence that you understand what is meant by the term. Yet there are particulars respecting it which are not usually understood by non-medical readers, and which you may not have considered.

I wish, especially, to warn you against a common mistake of the multitude—the unthinking and untaught of mankind. You must not look upon disease, in any case, as an entity, a thing which has personal existence and properties as such. This notion is very common, and leads to very erroneous conclusions respecting the nature of cure. Upon this false foundation is built the system of quackery of many kinds, and of quack medicines which are taken for the supposed purpose of destroying or banishing diseases as material intruders on the human body.

I have apprized you before that disease is a *deranged condition* of the body; and its most prominent symptoms consist essentially in the efforts or action of the *innate nervous power* to rectify the same. Remember that disease is always a process of the human system as natural as is that of health. Let me repeat, that it is an action of resistance set up by the curative power or nervous force, for the body's deliverance from the influence of noxious agents, and from the state of disorder which they have caused within it. The proper office of the physician is to aid that curative force by removing every hindrance to its successful action, and by guarding and guiding it to a favourable issue.



You know that the causes of disease are various; and that a numerous class of them have their origin in infection; that is, by the introduction of a highly concentrated, noxious, and invisible matter from without. This is usually the case in fevers, in malignant cholera, and all such like pestilential diseases. I must now refer you to what I have already stated to you in my previous letter on *membranous absorption* of the internal surface of the lungs. Besides this, however, there are circumstances under which certain infectious matters find their entrance into the human system by the membranous absorption of the skin, and of the stomach and bowels.

It becomes of the greatest moment to consider the important bearing of membranous absorption of the lungs on the origin of disease. Very frequently do the seeds of the most malignant disorders become mingled with the blood through this medium. You see, at once, the reason of it. Frequently are fevers of an intermittent kind, called *agues*, produced in fenny countries by the inhalation of miasmata or putrid vapours arising from the decomposition of vegetable matters.

In the unventilated, crowded, and uncleaned dwellings of the poor in large towns; also amid the putrifying animal and vegetable matters a deadly though unseen poison is constantly generated, which causes fever of a very fatal kind. It is inhaled by the lungs; and soon it destroys life by being brought into commixture with the blood through membranous absorption, and thus with the entire texture of the body.

There are other places and circumstances which favour the generation of matter which produces dangerous illness, and which gains entrance into the mass of blood through the same medium of the lungs by membranous absorption. Think of crowded, unwashed, and unventilated ships. Think also of the filthy and crowded gaols and dungeons of the unfortunate victims of Austrian and Italian cruelty of the darkest and most diabolical character, under which the best of their countrymen have suffered, and are now suffering unmerited torments! The heart sickens at the thought of such things. One really cannot wonder at the philanthropy of a Howard: for surely we ought

to have the blush of shame on our cheeks for our species, in thinking of those dark places and dark deeds of the earth. Yet, it is all in unison with the true nature of man when uncurbed by external circumstances. It is human depravity at liberty to act.

You will find the same consequences of crowded, ill-ventilated, and ill-arranged hospitals amid the destruction and desolation of war. You are aware of the occurrence of such consequences in the military hospitals of the armies of the Crimea. Well, indeed, is pestilence coupled with war, for they are a horrid pair! The mind revolts at the thought of the suffering and pestilence which overtook the thousands of our poor soldiers. One cannot wonder at so much as admire the philanthropic Florence Nightingale. It was woman's nature in one of its loveliest, most sublime, and most heroic aspects. Moral heroism alone, dear Sir, is worthy of the name, and of our respect—such as belonged to the conduct of the lady I allude to.

In all those places of filthy ships, gaols, dungeons, and hospitals, and in marshy lands, and dirty hovels of the poor, the extensive and delicate membrane of the lungs becomes the principal medium of communication by which pestilential diseases attack the human frame.

Of those diseases which arise from such causes a principal one is *Malignant Cholera*—the scourge so frequently in the hands of the long-suffering Almighty, for the chastisement of nations who forget Him.

The notice I have now to take of this pestilence must be much more brief than that in the previous edition of this little volume, in order to make room for other matter which I think more useful and more interesting to the general reader. I judge, too, that the circulation of a thousand copies of my book will have answered the purpose I had in view—to spread abroad the striking statistical report of the saline treatment of cholera in 1832, at the Cold Bathfield Prison, by Dr Stevens, and under the careful superintendence of my late excellent friend, Benjamin Rotch, Esq., who was at that time the chairman of the Middlesex board of magistrates.

There are certain instructive particulars belonging to this disease to which alone I now call your attention. You see in its supposed mode of communication a striking instance of what I have stated to you on the *membranous absorption* of the internal surface of the lungs, and of its powerful action: for how rapidly by this membrane does the infectious matter of cholera become mixed with the entire mass of the blood! Again, you see an illustration of the *innate curative power* of the human system in its action of resistance to the poison, in rousing the appropriate organs of excretion, which I have also described to you; in rousing, I say, the excretory action of the internal membrane of the stomach and bowels for its expulsion by vomiting and purging.

I must apprise you, that in this disease whilst these two processes are excited in such extreme degree the other secretory and excretory functions are at a stand. The liver secretes no bile, and the kidneys no urine; and the natural and usual action of the organs of digestion and nutrition are quite reversed. The whole organism is engaged in the one great effort to rid the blood of the poison of cholera.

I intend in my next letter to treat specially on the *innate curative power*. You can well suppose what an important bearing it has on life and health; for, the chance of recovery mainly depends on it. It is the *organic vitality*; and those individuals in whom it has been diminished by previous habits of intemperance are ever quickly destroyed by malignant cholera. This became well known when the pestilence prevailed in this country: and, on the contrary, that the temperate and hale were seldom attacked by it; and when this did occur they most frequently recovered.

Again, you see in cholera, so far at least, an illustration of what I stated on the *circle of influences*. In it the secondary nutritive organs are the primary seat of the disease; but so rapid is its progress that to a non-medical person it is difficult to discern what point of the body is the starting-point of attack.

You see also in cholera an illustration of the great fact that the blood is the chief medium of disease. In regard to many

other and less violent diseases, we are led to calculate on the relation between the blood and the correct performance of the digestive function; but in cholera it is the sudden and rapid deterioration of the entire mass of vital fluid from the admission of a powerful poison from without.

You must ever keep in mind, dear Sir, the fundamental doctrine that *organic nervous power* is the primary agent of life and health. That *secondary* to this, for the same purposes, are the functions of digestion, blood-making, and nutrition. Remember, also, the *circle of influences*, and that any cause of disease which acts on any one part of that circle must soon affect the whole, through the close connection existing between them. They act and react on each other. Keep in mind, that from the blood are formed all the tissues of the body: thus you perceive how the tissue of the organic nerves themselves must share in the effects of all the causes which influence blood-making at any stage of the process.

In this way, you perceive, the primary agent of life and health, namely, the organic nerves, may be variously affected in their structure and material. Understand me, that their component nervous matter may be variously altered in their *change of tissue*, according to the cause affecting it. Thus we can account in some measure for the great variety of nervous disorders, and especially of those directly associated with diseases of the digestive organs. In this way we may account for the many strange fancies and feelings of the dyspeptic and hypochondriacal invalid.

This point of nervous derangement through the deranged structure of the nerves, that is, their mal-nutrition, has in it much more than can be understood and explained. Equally incomprehensible is the mode of action of the causes of many malignant diseases which are of hereditary character; such as cancer and its numerous modifications, which I need not specify to you. There is scrofula also, with a numerous class of morbid conditions or disorders of the human system which are termed in technical language *peculiar* and *morbid idiosyncrasies*. Whatever may be the original cause of such conditions, you must regard them as constitutional, and as associated with morbid

assimilation of food, and a morbid state of the blood, and a morbid change of tissue. You must perceive, that with these conditions we must necessarily include the morbid state of *organic nervous matter*, which may stand in relation to the others as both cause and effect. It is in the *circle of influences*.

Moreover, you must recollect that the same cause of malnutrition, or morbid change of tissue, must also affect the brain and nerves of animal life, and give rise to some, at least, of the many kinds of *mental aberration or insanity*. Thus you perceive how intimate and important is the connection between the functions of digestion, blood-making, and nutrition, and the energy and permanent power of the mental faculties. Surely, you now see a sufficient and physiological reason for my earnestness in advising literary men, and especially ministers of the glorious Gospel, to give constant attention to the means of a healthy performance of these important functions. The means I allude to are comprised chiefly in diet and exercise: as a brief rule, *spare diet and plenty of exercise*. These, of course, are to be regulated according to the various requirements of each individual.

I often think of the cases of such men as the excellent Dr Watts. With all his gigantic power of intellect and excellence of Christian character, he proceeded in a course contrary to the laws of his physical constitution. He kept in close confinement to his studies, in the exercise of his mental powers, and in the neglect of diet and bodily exercise. He thereby became the victim of the strangest delusions respecting himself. He erred against the laws of organic life, and was overtaken by morbid organic impressions. The matter of his organic nerves became wrongly renewed, and wrong performance of their function was the natural result. Many very valuable years of his life were thus lost to himself and to the world.

It was otherwise, however, with the great John Wesley. You know that I am not a Wesleyan; yet I consider that John Wesley was a great man in the best sense of the word. With his innate shrewdness of intellect he became acquainted with the great fact respecting spare diet and plenty of exercise;

and through this knowledge he was enabled to preach and to travel until a very advanced age. He retained the vigour of manhood beyond the allotted age of man, three score years and ten.

Be assured that this great bearing of the *secondary* agent of life and health has greatly to do, through its derangement, in the causation and continuance of many diseases ; but my limited space does not permit me to pursue the subject in its particulars.

However, I must take special notice of the other very momentous bearing of this secondary agent of the blood circulation, in causing its *unequal distribution*. You can easily conceive that the same derangement of the process of nutrition or *renewal of tissue*, which affects the nervous tissue, must also affect that of the blood vessels ; and so it does. Because of this the blood vessels lose their wonted power of circulation ; and, as a consequence, we have congestion of the veins, and the similar condition of the arteries constitutes inflammation. In all this you perceive the deterioration of the organic power, and the deteriorated quality of the blood. Hence there are congestions and inflammations of a specific nature, and amongst these you will have gout and rheumatism, which are of the number of these diseased conditions. In these you see clearly the true nature of disease, and an illustration of the doctrine that it is a process of the human body as natural as is that of health.

You see in these diseases a similarity without the sameness of operation as in malignant cholera. In this pestilence the organic power directs its efforts to the expulsion of a malignant poison from the body by vomiting and purging ; whereas, in gout and in rheumatism the effort is for the removal of the less malignant matter of the disease, the *materies morbi* of technical language, from the internal and vital organs to the external parts ; and principally to the joints, and to such parts as are composed of a like tissue to that of its internal seat.

The eruptive or exanthematous fevers of measles, small pox, and scarlet fever, afford us also striking examples of the agency of the curative force. In these diseases the secondary agents of life and health, the digestive and nutritive organs, are pri-

marily affected ; and as their functions are indispensable to life itself, the curative force is exerted to remove the morbid action from them to the external skin. This is seen to demonstration in the cure of these diseases. When the eruption is not properly developed on the surface of the body they very generally prove fatal. They kill by their action on the internal organs. So also do gout and rheumatism when they prove fatal.

But I must now cut short this very interesting inquiry and investigation into particular diseases. Let me apprise you, however, that the same fundamental doctrine regarding the *primary* and *secondary* agents of health and disease is strictly correct in its application to all the conditions of the human body.

I intend to lead you to a just appreciation of the comparative efficiency of the different modes of cure which are advocated and practised in this country. I have already instructed you as to the true foundation of health, and disease, and its rational treatment. I intend to give you further illustration of these subjects, and more especially of the physiological principles laid down. Above all, I would lead you to a just appreciation of the primary agent, the *organic nervous power*.

## LETTER VIII.

ORGANIC VITALITY OR NERVOUS POWER—ITS CONNECTION WITH HEALTH, DISEASE, AND TREATMENT—VIS MEDICATRIX NATURÆ—ILLUSTRATIONS OF ITS ACTION—FAVOURABLE STATE OF MIND FOR IT—UNFAVOURABLE STATE—JOHN WESLEY'S GREAT TRUTH—HUFELAND'S STATEMENT—HAIR OF THE HEAD, AND CAUSES AFFECTING IT—MEDICINES AND THEIR TENDENCY OF ACTION, &c. &c.

MY DEAR SIR,

EVER welcome are your letters of inquiry, and I have much pleasure in giving you every information on the important subjects of our present very interesting correspondence. There is no point of human physiology which is of greater moment than that which is to be the chief subject of the three remaining letters I have yet to address to you. That subject is *the organic vitality—the vis medicatrix naturæ, or curative power of nature—the vital force—the organic nervous power—the nervous energy—the curative force—the innate nervous energy*. These various terms, and some others not specified here, are used by authors to signify the same thing. It matters not which one we adopt; indeed I shall use the terms indiscriminately.

I shall endeavour to explain to you, who are a non-medical reader, such particulars as I think the most necessary and important to be understood by you. I beg that you will give your earnest attention to what I bring before you: for the knowledge that I shall have imparted through these letters must prove of the greatest future service to you, and to every one who will carefully peruse them.

The *organic nervous power*, as I have already told you, is the primary agent of life and health; and you have to keep in mind that it is chiefly concerned in producing those unwonted conditions of the human system which constitute the symptoms of diseases, and by which they are usually named in the nosological language of our profession. Disease, I repeat, is a natural



process of the human body; as much so as is that of health. It consists, remember, of an effort of the organic nervous power to reestablish health, by opposing the influence of morbid agents. As I told you near the conclusion of my last letter, sometimes this innate nervous power is exerted for the expulsion of noxious and infectious matter from the body; as seen especially in malignant cholera and certain malignant fevers. Sometimes the morbid but less malignant agents affect more particularly the internal and nutritive organs; and the curative effort is then made for their removal from the internal to the external parts: this is seen in gout and rheumatism, also in the eruptive diseases of measles, small-pox, and scarlet fever.

Van Helmont's notion of the *vis medicatrix nature* was such that he personified it as a *grand ruler and regulator of the body*, and seated in the stomach. You may account for the foundation of his idea, so much does the condition of the human system, mental and bodily, depend on that of the stomach. As so often stated to you, the state of the digestive organs has a constant bearing on all the other organs of the body. The state of the digestive function affords us most frequently the best criterion by which to judge of the real condition of health; likewise of the *curative power* or *nervous energy* of the individual. To its derangement may be traced, directly or indirectly, a large majority of the diseases of the human body. Chiefly to the organs of digestion and nutrition ought ever to be directed our remedial measures, be they drugs, or the water processes, or any other mode of treatment. You recollect that in my small work on the Water Cure I have been particular in insisting on this great and essential principle of treatment. I think that I have proved, on physiological grounds, that it ought always to be the main object of consideration to the practitioner; and, on the same sure grounds, that the great Water Cure is necessarily a most efficacious and scientific system of therapeutics, or cure.

Nevertheless, you must keep in mind, that the condition of the digestive organs is very often to be considered as but *secondary* in its relation to disease, and not always as a *primary* cause, as Van Helmont seemed to suppose. It is dependent on

the state of the brain and nerves, as is the condition of all other organs of the body. They have reciprocal influence on each other. Forget not, however, that the direct agent or cause of all these vital functions is in the *organic or ganglionic nerves*, as clearly explained to you in my preceding letters.

The idea of Wepfer, a physician of Switzerland, respecting the *vis medicatrix naturæ*, was near the truth; yet he possessed not a clear understanding of the matter. He carried his notion too far, and made it too much of a distinct and personal nature. He called it *the president of the nervous system*: whereas, it is simply the nervous power itself, as you must now, surely, understand.

Stahl, a German physician, represented this *vis medicatrix naturæ* still more decidedly as a separate power. He, too, erred in pushing his idea of it too far, when he regarded it as a power of distinct and personal kind. He referred the government of the body "*directly and indirectly to the rational soul*"—not, however, in having a local habitation in any particular part, but diffused over the entire human system.

The observant practitioner sees constant proofs of a power in the human constitution which repairs its injuries, and even restores those parts that may have been destroyed. Properly and physiologically considered, the disturbing actions that constitute the principal symptoms of disease in the human body are, in reality, the salutary efforts of this innate curative power to remove the primary effects of noxious agents. This, I repeat, is seen very ostensibly in malignant cholera, in fever, and in gout and rheumatism. The same principle applies also to the operation of medicinal remedies, and is most conspicuous in that of emetics and purgatives, in which the organic irritability of the stomach and bowels is roused to rid themselves of the medicinal matters that have been introduced, and are foreign and offensive, and if retained, would interfere with their functions.

Disease being natural, and an action set up by this curative power for the body's deliverance from the influence of *noxious agents*, we arrive at the rational conclusion that, as I have

already stated to you, the proper office of the practitioner is to aid that curative power, by removing all hindrances to its effective action, and by guarding and guiding it to a successful issue.

Certainly we see that in the fracture of a bone, or in the division of a muscle, of a tendon, or of a nerve, the curative power effects a reünion. The exercise of that power is seen in the increased heat, vascularity, and sensibility of the surrounding parts, and this is called *healthy inflammation*. Without this, no healing process would proceed, no reünion would take place, as indeed we find to be the case in those of very infirm constitution, or of a disordered state of health, and especially of disordered digestive function. By proper treatment, in strengthening the constitution, but especially in improving the state of the stomach and digestive function, the healing process proceeds, and the cure is very soon accomplished. Sometimes, this healthy inflammation becomes too high, and there is excessive excitement, and it is necessary to moderate it to that degree which is required for the successful action of the curative power.

In cases of the entire loss of substance, as in wounds, or in ulcers, we see it repaired by the process of *granulation*. This process, by-the-by, is often dreaded by the ignorant patient, who calls it the *formation of proud flesh*; and very often have I been required to destroy it with caustic! In truth, we have sometimes to moderate it when too luxuriant, and rising above the level of the skin. Frequently, however, we have to resort to constitutional and local measures in order to forward it, when the *vital energy* is deficient.

Moreover, we frequently know of the reünion of parts which had been quite separated and removed, when they have been reäpplied without long delay; as a finger end, or a tooth. Such also is the vigour of the *curative power* in sound constitutions, that wounds even of the most vital organs of the body have been healed by it; as wounds of the lungs, of the heart, of the bladder, and of the brain.

Remember, that on sound physiological grounds, the progress of the most fatal diseases is in strict conformity with the

action of the *curative power*, or *vital energy*, or *organic vitality*. In the changes that take place in tubercles of the lungs, constituting *phthisis*, or *pulmonary consumption*, it is in reality the salutary effort of curative power to rid the body of morbid and specific matter of the blood. In favourable cases, when aided by judicious water treatment, it succeeds in that effort. Alas, however, much more frequently that aid has been sought too late; the blood has become too much deteriorated in quality; the structure of the lungs too much disorganized; organic vitality too much exhausted; and the body at length succumbs under the long-continued constitutional irritation, and the rapid and morbid waste of tissue. The body is literally consumed, and death, that comes to all, closes the long and fruitless struggle for life.

In this disease of pulmonary consumption, that destroys so many thousands of persons in this country every year, I have known very remarkable instances of the curative efforts of the innate organic nervous power to rescue the body from the malady. The case of the amiable young woman which I have noticed in my fourth letter, showing the power of the absorbent vessels to remove bone, is also very illustrative of the efforts of the innate curative power to remove morbid matter from the system. You remember that a large abscess or *vomica* made its way through two of the ribs, and discharged its contents externally, below the right breast.

It now occurs to me that the consumptive case of my excellent Christian friend, the late Rev. James Watson, was also a striking instance of the same kind. No doubt, the diseased condition of his lungs was much hastened by his great labours in preaching the glorious Gospel. He, dear Sir, was one of the few who are fully awake to the dread import and responsibility of the Christian ministry; and he laboured earnestly in it by preaching on week days as well as on the Sabbath day: sometimes, also, in the open air, and by other means belonging to it, that greatly exposed him to sudden changes of heat and cold, and to sudden chills. He consulted many medical practitioners about a soft kind of tumor which presented itself between the

shoulder-blades: but no treatment availed to alter it, until he went to a hydropathic establishment then adjoining the Windermere lake, and under Dr Paisley; and there it disappeared, and he was nearly restored in a few weeks. Most unadvisedly, however, he left too soon. On his resuming his ministerial labours to a limited extent, two small abscesses made their appearance a little lower down, and near the ends of the ribs. The case was of precisely the same nature as that of the young woman alluded to above. These abscesses were in communication with the lungs, and were the effects of the curative power exerted to remove their morbid irritation. But my very much loved friend died under the constant discharge and constitutional disturbance. He died of pulmonary consumption; and yet, like the young woman, he was without the two most prominent symptoms of the disease, namely, cough and spitting of matter from the lungs. In place of these he had the constant discharge of matter or pus from the abscesses at the ends of the ribs behind.

How cheering, under the loss of dear friends and relatives, becomes the look-back on their Christian excellence, and the assurance of their happy lot in eternal bliss and glory! Have you not thought of it, dear Sir? In all cases of bereavement by death, how tenaciously the memory of survivors clings to any evidence of Christian faith in those who have died, that they may cherish hope of their eternal welfare! How the mantle of forgetfulness is thrown over their past faults and failings, and how keenly is cherished the remembrance of their virtues!

I notice the error of ancient physicians, and of others without clear ideas concerning the true nature of this *vis medicatrix naturæ*, or curative power, and who have invested it with almost personal character. Its most correct definition is to be found in the term *organic vitality*. It exists in vegetable as well as in animal bodies; indeed, it constitutes vegetable life. Near the termination of the first of these letters I have treated of it in connection with the inseparable agent called *vital heat*, which is indispensably necessary to the life of vegetables,

as well as to that of animals which stand lower than man in the scale of organization. I may add here, that this *organic vitality* of vegetables is constantly before the minds of gardeners and florists in their various operations of grafting, pruning, budding, and rearing of plants and flowers. It is the efficient agent for success in such operations. It distinguishes vegetable bodies from inorganic matter. In animals there is the additional endowment of *animal life*, with its necessary instrumentality of a nervous system. In the higher order of animals termed *warm-blooded*, there is the further endowment of a *brain*, which is developed in accordance with their degree of intelligence.

In man the development of *brain* is most perfect, and becomes the organ of his *mind*—the grand endowment by which he has preëminence and governing power on the earth. It was the *fiat* of the ever blessed and omnipotent Creator—“*replenish the earth and subdue it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.*”

You must bear in mind, dear Sir, that besides the favourable state of the bodily constitution, which is necessary for the efficient and successful action of the *vis medicatrix naturæ* in the cure of diseases, *the state of the mind* has also a very powerful influence. The passions and emotions of the mind, that have such a marked effect on the functions of the skin and kidneys, and also on those of the stomach and bowels, have great influence likewise on *the curative power*, to increase or to lessen its activity and power.

I have frequently witnessed the favourable influence of well-supported confidence of recovery in patients who suffered under dangerous diseases. I have seen also very remarkable instances of fatal termination, which I have imputed chiefly to extreme mental despondency as to the prospect of recovery, although there was reasonable ground for hope of it. This is usually most conspicuous in cases of fever; so that some practitioners look on the state of the mind as a fair criterion by which to form their prognosis; that is, to judge as to the ultimate termination

of such cases. Not so, however, in pulmonary consumption, in which confidence of recovery may be almost taken as a symptom of the disease; so very often does the self-deluded patient entertain the brightest hopes of his recovery even when on the brink of the grave! He will buoy himself up in the prospect of executing plans and schemes at a future period that he is doomed never to see in this world! This, I believe, is owing to a morbid state of the brain.

When on this subject I ever think of the case of poor Pollok, the excellent Christian poet, and author of "*The Course of Time*." When he was in the last stage of pulmonary consumption, and on his way to Italy—which he never lived to reach—he greatly enjoyed the anticipation of a future and very extensive work that he intended to compose. It was to be "*a survey of the literature of all ages by the light of Divine revelation*," in five or six octavo volumes; and it was to occupy him five or six years in its composition! He spoke of it with much enthusiasm to my intimate friend, Dr Kirk, who informed me that its future achievement and its peculiar and superior characteristics became the chief subject of conversation between them during their voyage from Newhaven to London. But Pollok's work on earth was then already finished; for he died soon after, in his 28th year, to join *the great multitude which no man can number, who stand before the throne and before the Lamb, clothed in white robes*. His very fine poem, "*The Course of Time*," will live to delight and to benefit its readers in future ages.

You must surely allow, that the mental condition of despondency or of hope, in the instances just noticed, may be—must be—greatly influenced and overruled by Christian principle of the soul: and so it is most frequently, as I have often witnessed. Aye, Sir, the soul that enjoys full trust in the glorious and all-sufficient Saviour, enjoys also the blissful anticipation of future, endless, and heavenly happiness, and becomes scarcely amenable to the frail withering body, in these circumstances of fatal pulmonary consumption. It longs to be free indeed, and to be with Christ, "which is far better." What truly grand

scenes have I known of victory and triumph in dying Christians under this fatal malady ! They have, like Paul, challenged the sting of death, and the victory of the grave !

You now understand the separate and different functions of the nervous systems of the human frame. From what I have stated repeatedly in my previous letters concerning the organic or ganglionic system, you perceive how momentous its bearing on the condition of all organs and tissues of the body. You also perceive how correctly the organic vitality is named the *curative power* ; for this indeed constitutes that *power* for curative purposes. And you see how closely associated with it are the brain and animal system of nerves, although their functions are for the distinct purpose of connecting us with the world around us.

You must take into consideration that we constantly experience the effects on the functions of organic life, of those agents which act injuriously on the brain and nerves of animal life, whether they be of a material or of a mental nature. This must be borne in mind by you, as resulting from the intimate connection between the two systems of nerves. Ignorance of this fact has led so many writers on digestion and health to confound the two systems, and to speak of the brain and its nerves as the direct agent of the digestive function ; whereas, great as is their influence upon it, and rapid as is its operation, it is *indirect*, and through the medium of the *organic nerves* and *ganglionic centres*.

Because of the intimate connection between the two systems of nerves, mental causes have such power in causing disorder of the digestive and nutritive organs. You will do well to keep in mind that the whole functions of organic and of animal life constitute a *circle of influences*, as I stated in my last letter to you ; and that they act and react on each other in health, and disease, and its treatment.

The causes that operate to lessen the *curative force*, or *organic nervous energy*, are both of a material and of a mental nature. They have different degrees of power, and are directed to different parts of the *circle of influences*. I may just mention the depressing and exhausting influence of idle and luxurious habits,



which are too much practised in town life—untimely hours—midnight carousals—heated and ill-ventilated rooms—highly cooked food, prepared mainly for the palate and for stimulation—intoxicating drinks—cigars, tobacco, and snuff—soft feather-beds, and remaining long in bed in the morning after sufficient hours of sleep.

With the lower classes of society in towns, you have different causes constantly in operation to diminish the curative and protective power of organic nervous energy, and to make them more liable to disease and death. Of these causes are damp, crowded, and filthy dwellings—deficient and unwholesome food—dirty habits, in unwashed skins and dirty linen—smoking and chewing tobacco—often the use of intoxicating drinks, which is the most prolific source of crime, misery, disease, and death.

Depressing passions tend much to cause disease and death, by lowering the tone of the nerves: as grief and fear, remorse for the past, and despair for the future. It is ever a strong impression of my mind, and you surely must perceive, what a mighty and unbounded influence for all good is our glorious Christianity! Yes, for *all* good—for spiritual and bodily—for present and for future. This truly blessed power has on it the stamp of its Divine origin, which meets us in every exercise of our minds on the things of mankind. You see, that in the matter of health and life it must have a very powerful influence, directly and indirectly, in its benign and cheering effects on the mind of the true Christian. It also secures those habits of life that are most conducive to his body's health and well-being, as well as to those of his deathless soul.

John Wesley stated a great truth, too little considered, when he wrote, "The love of God, as it is the sovereign remedy of all miseries, so, in particular, it effectually prevents all the bodily disorders the passions introduce, by keeping the passions themselves within due bounds. And by the unspeakable joy and perfect calm serenity and tranquillity it gives the mind, it becomes the most powerful of all the means of health and long life."

Hufeland writes that the joy of domestic life—of friendship—

and that of contemplating the beauties of nature, constitute a great *panacea*, or remedy for all diseases : and that they become a more positive means of health than all the vital elixirs in the world. Many medical authors have expressed their strong conviction in the same terms ; and there can be no reasonable doubt on the subject. As Christianity is the source of the highest, and purest, and most permanent joy on earth, so does it become a most effective cause of health and long life.

The effects of morbid or disease-causing agents are usually known in their operation on the blood, to affect its quality ; but not, as is commonly supposed, to alter its quantity so much as to cause its *unequal distribution*. When the capillary arteries are thus affected, and have an excessive quantity of their contents, we have *inflammation*. It is called *congestion*, when a similar state of unequal distribution affects the capillary veins. You are aware that these organs of blood-circulation are under the direct influence of the organic nervous power, although so greatly subject to that of the brain and its nerves. These disordered states of the circulation are of a *secondary* character, although so frequently the first visible proofs of disease ; and the means of cure are usually directed against them. Remember that the *primary* effects of morbid causes must be on the nerves, and chiefly on those of the organic system, but implicating also the brain and animal nerves.

In treating disease the judicious practitioner ever keeps in mind the condition of the nervous system, as I have so often stated to you. His attention will be fixed on the *curative force*, or *organic nervous energy*.

I am here reminded of the point of physiology on which you sought information in a former letter to me. I made some allusion to it in my previous treatise, knowing that so much ignorance and imposition prevail in the world concerning it. I mean the close connection between the *curative force*, or *organic nervous energy*, and the growth and healthy condition of the hair of the head. It also illustrates the close connection between the organic nerves and those of the brain and animal life.

I state again that the hair of the head depends entirely on

the *nervous power* we are now considering, for its permanence of colour, its strength, and its growth. This fact in physiology is quite established. It is so continually demonstrated before our eyes, that we may wonder how the inventors and dealers in quack remedies for baldness and grey hairs succeed so well in imposing upon their customers with their *bear's grease*, and *Macassar oil*, and *balms* of strange names, and such like. These men have also published their treatises on the hair; and they tell their readers how much the roots of the hairs are nourished and strengthened by their patent preparations! Their success in deceiving is no such very great wonder, however, when we consider that their customers are of a certain class of mankind—chiefly, I suppose, the young, the vain, and the uninformed, who are so anxious concerning their outward adornment.

A moment's reflection must suffice to settle the point, that no external and local application can possibly furnish *nervous power*, on which alone the growth of the hair depends. As I wrote before, in the other volume—"Never was there one single hair produced by such means, and most assuredly there never will be."

It becomes quite plain that whatever gives tone and vigour to the nervous system will also favour the growth and healthy condition of the hair; and nothing else will do it. We may understand this when we think on the causes which operate most powerfully in destroying and changing the colour of the hair. Such causes are invariably of an *exhausting* nature, such as severe mental agony, so often endured by the unfortunate of mankind who mourn in prisons and dungeons.

How much of this was seen at the French Revolution of 1792! It is in the history of that period that we read how many of the victims of human cruelty became rapidly grey-headed and bald, even in a few hours. The poor Queen Marie Antoinette was one remarkable instance; for she could scarcely be recognised on the scaffold as the youthful and beautiful woman previously to her brief imprisonment. Grief had distorted her features, and had caused her dark ringlets to become grey! There have been innumerable instances of a similar

kind; the same effect of the same cause of fear, grief, and care, is of constant occurrence. The relation of a few other authentic cases may serve to impress the interesting fact on your mind, as well as the correct physiological doctrine respecting the same.

A boy of 15 or 16 years of age had a rope tied around him, and was let down some yards from a very high cliff by his schoolfellow, for the purpose of robbing hawks' nests. He could not draw him up again, and the adventurous youth was left suspended for a few hours. When proper assistance was obtained, and he was rescued from his frightful position, his dark hair had become white.

An affectionate lady of some 20 years of age was affianced to a youth, and the day of their marriage was fixed. He was at a distance, and had to take a sea-voyage in order to be present at the appointed time and place. Instead of the expected bridegroom a messenger arrived to announce to her that her lover was shipwrecked and drowned. She instantly became insensible, and in 12 hours her raven ringlets became white as snow.

It is a fact in history that the hair of Sir Thomas Moore became quite grey in the night before his execution. You recollect the case of the Austrian soldier John Libeny, who attempted the assassination of the Emperor Francis Joseph in 1855. As related in the *Times* newspaper—"His hair, which was black, had become nearly snow white in the preceding 48 hours, and hung wildly about his head; his eyes seemed to be starting from their sockets, and his whole frame was convulsed."

And you know that Orsini, who lately erred so greatly in his vindictive attempt to assassinate the Emperor Napoleon III. at Paris, had the hair of his head changed from black to white during the brief period between his arrest and his execution.

The horrid dungeons of the Neapolitan and Austrian despot could furnish, at this moment, many instances of the physiological fact I am alluding to—instances of cruel imprisonment and torture of unoffending men. The correspondents of our

leading newspapers inform us that it is no uncommon circumstance for such prisoners to have their hair blanched through mental agony.

You can now comprehend the fact that the water treatment has so frequently produced very favourable effects on the hair of the head, as I have witnessed, in both improving its quality and causing its reproduction in individuals of suitable age. The action of the water processes, with that of the auxiliary means, is markedly on the nervous power, to exalt and increase it.

You can now also account for the destruction of the hair by the use of tobacco, which destroys nervous power. Of this effect of tobacco I am quite convinced by the very numerous instances which I have witnessed, and many of them were of a very striking character. Hence, also, the debauchee, the drunkard, and the gourmand become bald and greyheaded before their time. Frequently, also, the hard student and close thinker becomes so prematurely, from over-exertion and consequent exhaustion of the nervous power.

In the action of all causes of disease, be they of mental or of physical nature, *the innate curative force* is depressed or deranged by them. They act primarily on the nerves. Yet they do not uniformly and equally affect the entire nervous systems, animal and organic. Some physical causes, we know, act more decidedly on certain textures or organs. Mental causes, likewise, have their action directed to certain organs, to disturb their functions. The ancients noticed this circumstance; and seeing that the indulgence of certain passions induced derangement of certain organs, they assigned accordingly a local habitation for each. Thus the heart became, with them, the seat of love; the liver was supposed to be the seat of jealousy—*jaundice-eyed jealousy*; the brain was the seat of anger.

Further, you must have observed that certain mental emotions more particularly affect certain nerves—that joy, acting on particular nerves, gives rise to the muscular action which constitutes smiling—that a certain combination or greater degree of this will cause laughter—that hatred, through other

nervous influence, will cause the frown, by corrugating the skin of the brow. Again, grief gives rise to sighing.

I have further to apprise you, that a special tendency of action belongs also to different medicines; so that their operation is directed to particular textures and organs of the body. The knowledge of this fact has led to the classification of medicines in the old or Allopathic mode of administering them, according to their supposed power or tendency of action; as purgatives, diuretics, emetics, sudorifics, &c. &c.

The action of such medicines on the human body is always in relation to its condition at the time of their administration; as I noticed to you respecting the function of absorption. This becomes most active, and is most easily affected by drugs, in a lowered, exhausted, and empty state of the body. In the opposite state of plethora, or fulness, it becomes very difficult to move the absorbents to action. Again, as to the allopathic drugs called *tonics*, or *strengthening* ones, they will only act beneficially in a weakened state of the system. And sudorifics, or sweat-causing medicines, will only act as such under certain states of the body. The action of medicines is ever very precarious and uncertain.

As correctly remarked by Dr Paris in his *Pharmacologia*, "The *modus operandi* of remedies (medicines), or the great principles upon which they effect salutary changes in the morbid states of the body, is involved in considerable obscurity, and has given rise to much ingenious speculation and scientific controversy."

On the special action of medicines is founded the more modern system of *Homœopathy*. But it rests on a much more definite and intelligible principle than does the old system of medical practice termed *Allopathy*.

## LETTER IX.

HOMŒOPATHY AND ALLOPATHY—THEIR DEFINITION—DR F. R. HORN-  
ER'S LETTER TO THE GOVERNORS OF THE HULL INFIRMARY—BRIEF  
EXPLANATION OF HOMŒOPATHIC SCIENCE—CASES OF CURE—THE  
WATER CURE, AND CASES OF DOMESTIC TREATMENT—CASE OF SUD-  
DEN DEATH—CHRISTIAN TRIUMPH—BONAPARTE AND BARON LARRY,  
&c. &c.

MY DEAR SIR,

IN order to prepare you for the few following re-  
marks, I will here tell you the meaning and derivation of the  
two terms *Homœopathy* and *Allopathy*. I must, firstly, apprise  
you that the maxim of Homœopathy—*similia similibus curantur*  
—like are cured by like—includes its fundamental doctrine,  
namely, that the cure of a disease by drugs is most rapidly and  
safely effected by that medicine which has the power of pro-  
ducing, *in large doses, and on the healthy body*, a morbid state  
most similar to that of the disease to be cured. For instance,  
Peruvian bark will produce, *in a healthy individual, and in large*  
*doses*, the morbid state most similar to ague, or intermittent  
fever. And mercury will produce the state most similar to  
venereal diseases. And sulphur will produce an eruption on  
the skin most similar to the itch. And these three drugs be-  
come the proper Homœopathic remedies for the three diseases  
here mentioned. On the same principle of *simile* are all  
Homœopathic remedies administered.

But further, in order to ascertain what morbid states of the  
body any medicines will produce, and consequently against what  
diseases they will become the best remedies, they must be *tested*  
or *proved singly* on the healthy body.

Again, That medicines must be administered *singly and alone*  
when used for the cure of disease. Again, That for the cure  
of disease, medicines must be given in much smaller doses than  
for the production of the morbid state on the healthy body.

Remember, that it is a fixed law in physiology that no two

actions, however similar, can proceed at the same time in any one texture or part of the human body.

The term *Homœopathy* is derived from the Greek words *omos*, or *omoios*, like or similar—and *pathos*, a disease, or feeling. Homœopathic medicines are similar in their action to that of the disease which they have to cure.

The term *Allopathy* is derived from the Greek word *allos*, other, or different, and *pathos*, a disease. It is the old system of medical practice, and its fundamental principle is—to cure diseases by causing an action which is contrary or different to that of the disease to be cured. Its maxim of old was "*contraria contrariis medentur*"—contrary are cured by contrary.

Whilst this little treatise was in the press I was tempted to interrupt the printers in their work, in order to give a more prominent place to Homœopathy in its pages, and a more decided expression of my opinion and experience respecting it. I found that at that time my brother, Dr F. R. Horner of Hull, was about to publish his pamphlet—"a *Letter to the Governors of the Hull Infirmary*," in which he held the office of senior physician. In that letter he states his principal reasons for adopting the Homœopathic in place of the old or Allopathic mode of treating diseases. I need say no more, for you have got and perused that decisive testimony on the subject; and have, no doubt, formed your opinion of the whole affair. You are also aware that his adoption of the *rational* for the really *more empirical* system of cure brought down upon him the puny wrath of his medical brethren of the town of Hull, with two very puny and very abusive pamphlets. Most to be regretted is the fact, that the governors did not display a more manly and more generous bearing than was exhibited by them in his removal from office in their Infirmary. However, the whole affair is now a thing of the past, and we will therefore pass it over.

I now candidly state to you, that the decided position taken by my brother, and my own knowledge of his character, that it could be only on his conviction of *the truth of Homœopathy*,



made me determined to scrutinize more thoroughly the real grounds of that mode of cure. I resolved to put to rigid proof the principles and practice of it as he had just done. Very soon I had abundance of suitable cases by which to establish a decided judgment.

As with the other kinds of treatment alluded to in this volume, so in that of Homœopathy I determined to regard *facts and experience*, and not to discard the subject because of my own inability to explain every particular of the *modus operandi*, or mode of action. Nothing can be more unreasonable than the latter mode of procedure: for, on the same grounds we may refuse to believe the most common things of every-day life. In truth, however, the medical opponents of Homœopathy, and indeed of all other systems than their own, have become notorious for their misapprehension of its fundamental doctrine, "*similia similibus curantur*," like are cured by like. I have not space for a minute account of the subject before us; but as briefly as possible let me tell you, that these opponents are ever stumbling at things that are quite irrelevant to the main question—such as at the infinitesimal doses, and at the effects of diet and regimen, also at the power of the imagination, &c., &c. Whereas, the minuteness of Homœopathic doses becomes but a necessary sequence or consequence of the fundamental doctrine of *simile*—and attention to diet and regimen is as necessary and effective in Allopathic as in Homœopathic treatment. Again, the imagination cannot have power to cure in children, and in infants at the mother's breast, amongst whom I have had many of my remarkably successful cases of Homœopathic treatment; as also other practitioners are constantly having.

Further, dear Sir, you must perceive that in strict accordance with this doctrine of *simile*, the morbid or disease-causing agents being inappreciable in their minuteness of quantity, so also may be that which is effective in the remedies used against them. Again, the causes of disease operate on the capillary or most minute textures of the body: therefore a proportionate minuteness or inappreciable fineness of matter must be required

for the purpose of cure. Homœopathists term the acting power *dynamic*. It is purely a Greek term signifying *power*, or rather, *pertaining to power*.

The fundamental idea of the Homœopathic physician is that of *likeness* or *similarity* between the action of his remedies and that of the disease to be cured by them. With this he connects the other idea of *substitution*, or *supplanting*. On due reflection you will understand that this is the true philosophy of the science. Hence, too, he uses only *one* medicine at a time, in order to secure a *oneness* of action, to meet and to supplant that of the disease. Remember, that the doctrine of *similia similibus curantur* is the sum and substance of Homœopathic science, and that all the other particulars in the practice of it become necessary sequences of this. In inseparable connection also stands the evidently correct tenet that the genuine action of any medicine can only be ascertained by testing it on the *healthy body*, and not in its *diseased condition*, as is done by the old or Allopathic school. And, further, that the remedy must be administered according to the various and ever-varying circumstances of the constitution, and habits of life, and so on. It need not be a matter of wonder nor of disappointment, that we occasionally meet with constitutions or states of the human body in which ordinary doses of Homœopathic remedies are greatly resisted, just as the same states of body are constantly resisting the attacks of morbid agents. And, on the contrary, in some constitutions we find a particular susceptibility to the action both of diseases and of their proper Homœopathic remedies.

In the hands of the skilful physician, Homœopathy becomes more effective in correcting the diseased conditions of the human body, and in much less time, than is usually done with Allopathic drugs; and with the very great advantage of doing so without inflicting injury upon it: whereas, the Allopathic remedies cannot be administered without injury; and this has been frequently so severe and permanent, that the means of treatment have proved worse in their ultimate consequences than the disease which they may have removed. Nevertheless, I cannot agree with the sweeping and extreme views of some of

the Homœopathic writers against Allopathic practice. Yet, whilst I candidly make this statement to you, I would more emphatically warn you against the much more unreasonable and unfair opposition of many Allopathic medical opponents. Most unreasonable must be their severe condemnation of a system of treatment of which they, at the same time, betray their ignorance, and which their prejudice will not allow them practically to investigate. Their unfairness or misapprehension is shown in their frequent attacks on points which do not belong to Homœopathy, but are rather borrowed from their own Allopathic theory.

I will here notice more particularly the one common outcry against infinitesimal doses already mentioned, that I may instruct you concerning the principle on which they are administered. Let me, firstly, explain to you what is meant in my previous statement, that they become a necessary sequence of Homœopathic doctrine. As in medical language the causes of disease are termed *morbific*, or *disease-causing*, so the action of Homœopathic medicines is termed *pathogenetic*, the former term is purely of Latin, and the latter is as purely of Greek derivation. Now, in strict etymology, these two terms are really synonymous, or of the same meaning. In Homœopathy, however, they are not of the same application: the former term, *morbific*, applies to the action of any cause of disease, whilst the latter term, *pathogenetic*, applies only to the action of any Homœopathic remedy. Mark me, then, that any Homœopathic medicine which is the suitable remedy for a disease, is said to be *pathogenetic* in relation to it; that is, it cures by virtue of its power to produce, in large doses, a like or similar condition; because *similia similibus curantur*, like are cured by like; and because no two *different* actions, however *similar*, can exist at the same time in any one tissue or part of the animal frame.

I wish you to remember the correct and significant application of this important word, *pathogenetic*, which, I believe, was invented by Hahnemann, in accordance with the fundamental Homœopathic principle of *simile*. The one common blunder which Allopathic opponents are continually committing, arises from their

misapprehension of that principle. You will see an explanation of it at the 33rd page of my brother's pamphlet, the letter to the sapient Governors of the Hull Infirmary, where he tells of the *proof positive*. Not long since I myself met with a striking instance of the very error he there alludes to. A physician of extensive practice, and who talks freely and ignorantly of Homœopathic *quackery*, said to me that he knew of a certain individual who, in *proof positive* of the utter worthlessness of infinitesimal doses, had actually swallowed a whole tube-ful of *arsenic globules*, and had then laughed at it, without any harm! Poor man, he had never studied the principles nor tried the practice of Homœopathy, and he knew not of the *pathogenetic* action of medicines. In other words, he knew not that, as stated in the pamphlet just referred to, "Homœopathic medicines are definite in their action, and when taken, they affect only the disturbed or deranged vital action of certain parts implicated in disease; so that when a person in health 'swallows a handful,' he does not, of course, experience their effect, inasmuch as there is no *highly sensitive and diseased* part to act upon. Nay, further, on the very principle of Homœopathy *similia similibus curantur*, the aforesaid 'handful' would not produce specific effect even on a person suffering from disease, unless the medicine so taken were *pathogenetic*, or, in other words, was the proper medicine for acting on that disease."

Further and correctly on this point he states on the next page of his pamphlet, "Here we see the excellence, the simplicity, and the safety of the Homœopathic treatment; and how favourably it is contrasted with the strong drugs and the often yet stronger means employed by the old system of practice. Truly, well would it be for the public if bleeding and blisters, emetics, purgatives, and mercury, &c., could also do no harm on their being used when they are not required!"

Now, as far as my limited space will allow, I will notice a few cases which have been lately under my care, and treated by me on strictly Homœopathic principles. I select those individuals with whom I know you had personal acquaintance when you were living amongst us, and who are well known in these parts.

I begin with the case of Mr St John Barley, of Wildon Hill, near Coxwold. In June last he was attacked with very severe inflammation of the lungs, involving also the *pleura*, or lining membrane of the chest which covers also the lungs. I merely state the principal facts—that, firstly, he had been skilfully treated according to the old or Allopathic system, by his intelligent medical attendant Mr Smith, with whom I held two consultations. The disease was subdued, and he became convalescent. After a week or two a relapse took place from exposure to cold, and all the violent symptoms returned. He was then put under my exclusive care; and, fortunately for him, I had Homœopathy at hand, by which to deal with his very dangerous condition, exhausted as he was by the disease and by the previous severe, though Allopathically skilful, treatment. I do believe that a repetition of such means would have put out the little vital power which then remained. I felt very anxious about him, and was in great fear that he would not long survive. Indeed, I did not conceal my unfavourable opinion from his brother, Mr Robert Barley; but so evident were the signs of approaching death, that my announcement did not at all surprise him. I have only to add, that after three or four days of doubt and danger, the disease was again subdued; and in a few more days he made rapid progress towards his former health and strength, and was cured by Homœopathic treatment.

The next case is that of Mrs Margaret Grainger, of Bagby, whom you know to be a poor woman. She was attacked with what is usually denominated *English cholera*, with violent vomiting and purging. She was very ill, and much exhausted, and could not retain on her stomach the water she drank. Well, the third dose of Homœopathic medicine which was administered brought welcome relief to her, and she rapidly recovered. But the main reason of my alluding to this case is the striking fact, that in a few days after her recovery, her daughter, aged five years, was attacked with the same complaint, and in equal severity. The mother told me, that thinking how very effectual had been the *bottle* for herself, she had given of it to her child; and that “*it cured her directly.*” This is a simple state-

ment, but I thought it very demonstrative of the power of Homœopathic treatment.

Another case. The father of Miss Elizabeth Bendelow, of Burneston, near Bedale, and ten miles from Thirsk, came to me on Monday, the 25th of May last. His daughter, he said, was dying of a rapid consumption, by which disease he had previously lost a son and a daughter. In much sorrow he declared his belief that I should not be able to arrest the complaint which was about to take away his one surviving child: but her sufferings were so great from pain, incessant cough, and expectoration, with much fever, and feeling of extreme weakness, that he requested that I would visit her immediately. I went that afternoon. The Allopathic medicine she was taking was at once discontinued at my desire; and at her bedside I made up what proved to be the real remedy for her case. It was, of course, Homœopathic; and the good effects which it produced were confessedly beyond what I anticipated. I am stating a fact. I returned on the Wednesday, and found her out of bed, down stairs, and much better. The gladdened father came to me again on the Sunday for more medicines, and reported that she was much better. On the Tuesday following—eight days after my first visit—she travelled by a gig conveyance, and met me at Bedale, where I had professional duty; and she continues to this day without any symptom of disease.

I must find space for a brief notice of two other cases, in one family. Mr John Clark, of Borrowby, came to me in November, and in great alarm concerning his son, Mr Thomas Clark, who was prostrate in bed, and afflicted with a severe and extensive *Erysipelas*. He wished to see me immediately: on my arrival I found my patient in a truly deplorable condition. His neck was nearly on a level with his face, as he lay extended on his back in bed. On each side of his neck and under each ear the swelling was prominent and very painful, so that he could not bear the contact of the bedclothes. He could scarcely breathe, or swallow, or speak an audible word. The swelling and redness extended to below the chest.

The disease had commenced on the Sunday preceding, and he

had been under the care of an Allopathic practitioner until the Friday following, when I first visited him. On this day I confessed my fear that he was beyond the reach of any remedial means: yet, to my surprise and delight, he began immediately to amend on taking the Homœopathic remedies which I administered. In forty-eight hours he was nearly well. On the Monday morning his astonished father came to me, and announced that he was cured! I only visited him twice; and on his coming to my house a few days after, in behalf of his mother, I did not recognize him at first sight, so much was he disfigured when I had last seen him on his sick bed.

In a few days Mr Clark again sought my professional service, for Mrs Clark, who was attacked with the same disease, induced by her close attendance on her son. When called to see her I found her eyes swollen and closed up with the *Erysipelatous inflammation*, which also extended over the forehead and scalp. I administered the Homœopathic remedies which had proved so effectual in the case of her son. But in her case at least double the length of time of his treatment had passed before a decided improvement of her state was manifested. However, it did soon appear, and then went on with far greater rapidity, and with infinitely less injury to her frame than could have been effected by any Allopathic treatment. I shall not soon forget the expression of wonder and thankfulness of the father, on the occasion of the rapid change which was wrought by the treatment on his son, and with medicine, he said, which looked so much like water!

Just one more case—which took place in July last. It was at the evening twilight when Thomas Hepton, of Thirsk, brought his daughter to me. She was sixteen years of age, and had that day left her place of servitude because of a severe inflammation of her left eye. Her father, I say, came with her to my house a little before dark; and I could discern, by carefully, but with difficulty, separating the eyelids, that the internal part of the eye was very red with inflammation. I spoke of the immediate need of a large number of leeches, according to the old practice; but I wished him to try another remedy until

next morning; and we would then consider what should be done. She was to take one table-spoonful of a water-like mixture (a solution of globules) every two hours during the night, and to call again at eight o'clock next morning. He and she came in utter surprise and delight that all signs of the previous inflammation had disappeared! and she was quite cured.

I could proceed to tell you of many other equally surprising cases of cure by Homœopathic remedies, during the last few months of my more testing practice with them; and especially amongst children and infants at the breast. But I must here close my report; and you will not be surprised to learn from me, that my conviction is now *firm and final* as to *the great truth of Homœopathy*. Nevertheless, I am not a jot the less convinced that there is also *the great truth of Hydropathy*, and *the great truth of Mesmerism or Animal Magnetism*, and other *great truths* in connection with other modes of cure.

The considerable obscurity alluded to by Dr Paris, as belonging to the action of medicinal substances, becomes the cause of uncertainty to drug medication of all kinds. You must perceive, however, that a grand simplicity belongs to the practice of the Water Cure, as far as its means and appliances are concerned. It is that of nature, in its fundamental principle, and has nothing complicated in its means of cure. It is the scientific regulation of the wisely-ordained means of life and health, for the purpose of correcting the effects of misuse or neglect of the same, and the other causes of disease. The predominant principle of water treatment is to aid, to evoke, and to exalt the vital force or curative power—the power which acts in building up the animal system, and in protecting it when under the influence of external and unfavourable agents. It repairs its losses, supplies its wants, and corrects its aberrations. It makes it and mends it. With this decided advantage of the Water Cure, it can also accomplish, through its different processes, whatever can be done by the use of drugs—and with more certainty and power, excepting the violent action of purgatives and emetics, such as ought most seldom to be used.

Whatever mode of treatment he may adopt, and whatever



may be the condition of his patient, the intelligent practitioner of the healing art ever keeps in view the efficient operation of the curative force, or organic nervous energy. You can readily suppose that it becomes most powerful in youth and manhood, and under circumstances the most conducive to health. It is especially so in persons who are constantly occupied in agricultural labour.

A striking illustration of the statement just made occurred to myself a few years ago. I was sent for, in my professional capacity, to a severe case of accident by a thrashing machine. A fine, healthy Irish lad, of sixteen years of age, was at work with others on the premises of Mr Thomas Rose, of High House, near Thirkleby: and he got so entangled in the machinery that his foot was nearly torn from its connection at the ankle joint. When his fellow-servants got to him they found the sole of the foot bent firmly back upon the calf of the same leg; and this foot was kept attached to the leg chiefly by the large tendon of its muscles behind, and which is inserted into the heel. The principal blood-vessels were fortunately left uninjured. In their hurry to restore the foot to its usual position, they had caused a large part of his stocking to be clinched in the centre of the broken ankle-joint, and which we found and removed on our examination of the parts. I had sent for two neighbouring surgeons, with the instruction that they were to bring with them the proper instruments for amputation. A considerable length of the lower end of the tibia (the large bone of the leg) was quite bare, and protruded badly, so that we could not cover it with any adjoining living substance.

It was really a severe case of injury. We found, however, that by sawing off the protruding part of the bone, we could bring the leg and foot into juxta-position. The great tendon, which forms the main strength of the connection, still remained uninjured, and with it the principal blood-vessels behind. Again, such was the healthiness of his constitution, and so desirable was the preservation of his foot, that we resolved to give him the chance of it, slight as it really appeared; and if the attempt proved a failure, we could amputate it a day or two later.

The protruding end of the large bone, which had formed the principal part of the ankle joint, was sawn off: the whole was adjusted and dressed in the proper manner; and a suitable person was left with him all night. The case proceeded most favourably; the foot became again so well connected with the leg, that, in a fortnight from the time of the accident, it was difficult to suppose that it had ever been so separated and injured. The principal difference to be observed between the two limbs was in the one being rather shorter than the other. But the lad really experienced no material inconvenience from the accident. This was owing entirely to the extraordinary degree of organic vitality in his constitution. Under different circumstances, and in other individuals of diminished nervous power, such as drunkards and gourmands of idle lives, the saving of life, even, might have been a difficult undertaking; and to save the foot no attempt would have been made by any judicious surgeon.

Many other cases of a similar character might be advanced. More particularly, however, at Hydropathic establishments are instances constantly occurring, that show the effects of different, preceding morbid causes in depressing the innate curative power; and that prove, also, the extraordinary efficacy of water treatment in rousing that power to an effective action for the restoration of health. I have had such cases under my care. I will state one or two remarkable instances of rescue from disease by the more limited mode of domestic water treatment, showing the action of the curative force.

One of a striking character was treated Hydropathically at home by my excellent friend, the Rev. John Sutcliffe, now of Heyworth, near Nottingham. Firstly, however, I must inform you, that some five years previously he himself had been declared to be in a dying state, and decidedly consumptive. He came to Thirsk for my opinion and advice. Seeing the mistake of his medical adviser at home, and that the main ailment of my friend consisted in a disordered condition of his digestive organs, with much nervous disturbance in connection, I prescribed immediate water treatment, in shallow baths and shower baths,

with much friction of the skin, and exercise in pure air, with a correct regulation of diet. I administered to him, besides, a very effective remedy in his case: it was to operate on the mind, and it consisted in my firm assurance that his lungs were quite sound, and that by his determined obedience to my directions he would soon be restored.

I may state that he began to improve from that moment; for hope cheered him, and he became resolute to obey. The next morning he commenced the vigorous application of the means,—the cold shallow bath and shower bath, with much friction of the skin. He took walking exercise, and attended to diet according to orders. Positively, in some two or three weeks he had no symptoms of disease about him. His *vital force* or *curative power* was evoked to action, and soon rectified the disorder of his digestive and nutritive organs. He wisely continued his morning baths and morning exercise, and never took any more medicine from that time to the present. He became a zealous advocate of the water treatment; and both adopted it himself, and recommended it to others on every occasion of indisposition that came before him.

Some five years after this, his brother arrived at his house, with a motherless little boy in a very deplorable condition of disease. I did not see the child; but others, who did, have told me that he was really a most pitiable object. It was a bad case of rickets, technically called *rachitis*, and *mollities ossium*, or *softening of the bones*.

I might give you many interesting particulars of this disease of *mollities ossium*. It would be out of place here, however. I may just state, that, as the name denotes, the bones become quite soft and flexible. This takes place because of the want of the earthy ingredient, called phosphate of lime, in their composition; as I explained in the second of these letters. And in this case they could twist the feet in any direction without injury. The sutures of the bones of the cranium, or skull, remained open, so that the head was enormously large, and could be compressed by the hands.

The entire constitutions of such patients are radically bad.

There are, indeed, varieties of the disease, but in all there is a great deficiency in the formation of bone; and a most deplorable state supervenes. The organs of digestion, assimilation, and bloodmaking are at fault; and most decidedly powerful and highly salutary must have been the means which could accomplish the improvement of that condition. Such must have been the water processes which my friend made use of in his treatment of his afflicted nephew.

But, firstly, he called in his usual medical attendant; and, on hearing from him that nothing could be done by medicinal means, he inquired if he might apply water treatment with safety. He got no encouragement, but a gentle warning to be cautious; and mainly on his own responsibility he commenced the same water treatment which had proved so very successful on himself five years before. The effects were very gratifying; and he ultimately succeeded in restoring the very rickety child of four-and-a-half years of age to perfect health and strength. It was a kind of Græfenberg treatment, and most satisfactory. I applied for a written report of the case and treatment. I was immediately favoured with a letter. I find, however, that it is short and imperfect, being without the particulars of treatment and progress in recovery; just as a non-professional practitioner may be expected to report. Yet it is so far satisfactory, as to the general facts of the case, inclusive also of a notice of two or three others, that I copy it for your perusal.—

TO J. HORNER, Esq., M.D.

“DEAR SIR,

“In answer to your inquiry concerning my little nephew, George Sutcliffe, I lay before you the following particulars. He was brought to my house by his father, in a lamentable state of decrepitude and weakness. Though four-and-a-half years of age, he could neither walk, stand, nor sit: in the last-named posture he would fall upon his head. He had, therefore, to lie upon a pallet by day and night. His head was frightfully large; his chest was what is called pigeon-

breasted; his abdomen protruded immensely; his legs were small and shapeless; and we could turn his feet entirely round. It was a case of rickets of the worst kind. He had been in a London hospital, and had been under the care of eminent medical men without success; and his case was deemed hopeless.

"About five years before he was brought to my house, I had been in a state of ill health, and my medical attendant had pronounced my ailment to be pulmonary consumption, and held out but faint hopes of my recovery. On hearing this, I came to Thirsk to seek your advice. You recommended copious applications of cold water every morning. I followed your advice, and in two or three weeks was fully restored. Recollecting this, I determined to try a similar method of treatment on my poor little relative. Soon it promised to yield its desired result. First he stood, next he walked from one chair to another, and then he sprang one morning out of the bath, and ran out of doors. For the last three or four years he has been in perfect health, and he is at present as fine a boy as the sun shines on.

"I have since fallen in with two or three children in a similar state, whose parents, on my recommendation, adopted the water treatment, with results similarly successful.

I remain,

Dear Sir,

Yours faithfully,

JOHN SUTOLIFFE."

Keyworth, near Nottingham,  
Aug. 1856."

I wish you particularly to mark, dear Sir, that in these cases of rickets the water processes, with the auxiliary means of much friction of the skin and regulation of diet, evoked and kept in action the innate curative power of the body, by which the digestive and nutritive functions were improved; by which, also, such desirable results were procured. In such cases, the efficacy and salutary power of the water processes become more

conspicuous, the cure being effected without the additional and very valuable means of exercise, with the joint influence of the mountain air and attractive scenery. The opponents of the water cure are ever ready to attribute the successful effects of water treatment to these auxiliary means, rather than to any sanative power of the baths.

In these cases no active exercise could be taken, no mountain air could be inhaled. Likewise, in many other kinds of illness the patient is frequently brought to the Hydropathic establishment alike unable to walk; and yet, by the judicious use of the water processes alone the primary part of the cure is accomplished. Such was the case with my patient at Malvern, (which is noticed in the treatise on the water cure,) who had not walked for many years before she came under my care; but at the end of four or five months, she took her ramble of five miles every morning before breakfast. And many others I could mention, in refutation of the opinions of opponents.

In the surgical case of the Irish lad, and also in these interesting ones of the domestic water treatment, the innate curative power was roused to successful action, with the happiest results. There have been many instances of the worst consequences of its low and unfavourable state in connection with a deteriorated state of the blood. In such instances, the slightest injury has become the ostensible cause of severe consequences,—the loss of a limb, or even of life.

In the practice of the intelligent practitioner it becomes a primary consideration in the treatment of every case before him, what is the amount of the curative force? What is the amount of constitutional, or nervous, or vital energy—the organic vitality? Every circumstance which can affect that power ought to be duly appreciated by him. Besides his calculation of this power at the outset of disease, it should be kept also in view at the different stages of illness, and under all the varying circumstances, whether of a material or of a mental nature.

Never shall I forget, dear Sir, a scene of death I witnessed many years ago, at the outset of my professional career; and in which I took a prominent part. It is now mentioned by

me to show to you the effects of mental causes on this *organic vitality*.

I was in professional attendance on a married woman in the lower rank of life, who, however, was a person of considerable mental sensibility and shrewdness. Her past life, alas! had not been such as she could look back upon with satisfaction; and I was one day summoned to visit her. She was confined to her bed, and was evidently in a very thoughtful mood concerning the *great hereafter*. Soon after my entrance into her room, and when I had taken a seat at her bedside, she fixed her eyes earnestly on mine, and with a rather firm voice she pointedly asked me my candid opinion on the likelihood of her recovery. Her words are still fresh in my memory after the lapse of so many years. "*I hope, Sir, that you think that I shall recover?*" She looked earnestly at me; and I replied conscientiously in the negative. She still stared at me, and with yet wider eyes, and more fixedly on mine. An attendant just had time to exclaim "*she's dying!*" and in less time than you, dear Sir, are now taking to read the words which tell the circumstance, she really died! The message in my reply to her question acted as a depressing mental agent too strong for her low state of *organic vitality*. The organic and vital function of the heart could no longer continue, and it ceased to act, and she to live!

In striking contrast to this affecting case, I could tell you of others in which the happiest results took place; chiefly in regard to the vast interests of the deathless soul, and the dread concerns of eternity; but, doubtless, also, in raising the *organic nervous energy*, to the great benefit of the bodily constitution; in causing a prolongation of life, and in smoothing the rugged passage to the grave.

Allow me to relate a few instructive particulars of a case which occurred many years ago, and which has an opposite bearing to that of the one just mentioned, in illustration of the curative force under the influence of mental causes. I will first make a few remarks in relation to the points before us. The conscientious physician is occasionally in a position of some

difficulty how to decide in regard to his proper duty to the patient. I allude to the duty of making known to him the approach of death; not only when there is unquestionable indication of the event being near, but also when his experience and knowledge enable him to foresee, that at a more distant, but not very remote period, it must necessarily take place. To some unreflecting though well-meaning people the duty appears plain and imperative; and that is, always and at once to make it known to the patient; because, say they, of the incalculable interest of the soul, which may greatly depend on the early announcement.

However, dear Sir, there are certain things which demand consideration in these cases. The safe and proper performance of the duty to the patient will depend on the circumstances, bodily and mental, of his case. Under all circumstances, the *manner and time* of making known the approach of death will be of the greatest moment. This was demonstrated in the afore-mentioned instance of sudden death, in which I had a part which will be a cause of regret to my mind whilst memory holds her seat there.

To return to the happy case I am to tell you of. It is, indeed, one out of many happy ones, the remembrance of which yields pleasure and profit to the mind. I received a neatly-written note, in which I was politely requested to visit professionally a young woman at a distance of seven miles from my house. She intimated in her note that she was very ill, and particularly wishful to see me, and to have my candid opinion on her case. Without any knowledge of the nature of her illness, I proceeded to her place of residence in a neighbouring town. On my arrival I found the house of a more humble description than I had expected from the style of her note to me.

I was met at the door by an aged woman, who told me that her daughter was really very ill; that she had been under the care of a surgeon for some months, without receiving any benefit; that now he very seldom visited her; that he would not or could not tell them what was the disease under which she had



suffered so long. Forthwith I was conducted to the chamber of the sick.

On my entrance I beheld a young woman of prepossessing appearance reclining on her bed. Her form was much emaciated by disease, but intelligence and amiableness of mind were depicted in her expressive countenance. She received me with complaisance and respect; and I was soon seated at her bedside, and occupied in examining her pulse and the symptoms of her complaint. I had no difficulty in deciding on its nature, and its sure termination. On resuming a settled posture in my chair, she fixed an inquiring and expressive gaze fully on me, and in a tone of some firmness, she said, "Sir, I have sent for you that I may have your decided opinion on my illness. I have very particularly to request your candid reply to two questions, which are—*what is my complaint?* and, *what hopes are there of my recovery?*" Instead of making immediate and direct answer to these two questions, I again felt her pulse, begging to be allowed a short time for consideration. The fact was, that I felt somewhat undecided as to the propriety of returning an answer as plainly as she had put the two questions. I was making some desultory remarks, and keeping her in conversation for awhile, when, with an earnest but kindly tone of voice she interrupted me, saying, "*The two questions, Sir, do be so kind as to answer them.*" Under an impression that I had no choice—no power of further evasion, I replied, placing my hand on hers, "*Your complaint is pulmonary consumption, far advanced—your hopes of recovery—none whatever.*" I had no time to doubt of the effect of this reply, for she at once exclaimed exultingly—"*Bless God, I am satisfied.*" She said it in a tone and manner which denoted thankfulness and joy. I was at once convinced what kind of person I had before me. I then said, "*I see that you are not afraid of dying.*" Well do I remember the emphasis with which she uttered—"*Oh, no, no, Sir, death is only sleeping in Jesus.*"

I must not go much further, or tell you of the many instructive and cheering particulars of the hour I spent at the bedside

of that happy triumphant believer in Christ; nor of the many happy hours I afterwards spent there at my future visits. One significant incident I must relate to you, which came before me at that first visit. It shows, dear Sir, how much others may be affected by what we sometimes say and do, and when we ourselves have lost all recollection and thought about it. When I had answered her two questions to her satisfaction, we soon became intimately acquainted. She told me that she had seen me two years before; and she had often thought of a striking sentence which she then heard from my lips. "*It was at a missionary meeting,*" she said; "*I was late in entering the chapel, and was going down the middle aisle of it, when you, Sir, in the chair, had just risen after the speech of another, and you said to the audience, 'Happiness depends not on external circumstances, but always on a principle within us.'*"

The facts of the case she alluded to I soon recollected. The preceding speaker she mentioned had been telling of a number of missionary converts, who were shipwrecked; and who, in the very jaws of death, and amid the waves of the sea, shouted praises to God and the Lamb! This gave him occasion to say to the audience, *that happiness depends not on external circumstances*. When he had concluded his speech I rose, in my office of chairman of the meeting, and added the latter half of the sentence for its completion. This was the time and circumstance to which she alluded. "*Oh!*" exclaimed my patient, Jane Ingledue, with holy emotion, "*how often have I thought on that sentence which I heard two years since from your lips, Sir, but now, bless God, I experience the truth of it;*" and placing her thin white hand on her bosom, she repeated, "*It is the principle within, the principle within, Sir, and now I feel it, the principle of faith in Christ Jesus!*"

I conclude unwillingly. That scene, Sir, which I then witnessed, was one of the sublimest character, and of moral grandeur far beyond all that the unaided philosophy of man could furnish. My patient lived most happily for several months after my first interview with her, and then died triumphantly, through the grand principle of faith in Christ within her, "the

hope of glory." This principle, which caused her to rejoice with exceeding joy, became the mental cause which had also a very favourable influence on her *curative force*, or innate *organic vitality*, and had much to do in prolonging her doomed life.

On the contrary, under different mental circumstances, and as I have known occasionally in this disease of pulmonary consumption, despondency has had an unfavourable influence, and has hurried the victim to the tomb. It is a well-known circumstance that so many who die of this disease entertain the hope of recovery to the last. But that delusive hope cannot have a power to prolong life as must have the cheering assurance of glory everlasting.

When I reflect on the trying circumstances in connection with the hours of sickness and of death, and when I recall to mind the instances which I have witnessed of the truest heroism and magnanimity displayed under the extreme things of that extremity to which we must all come, I turn, with feelings near akin to contempt, to the much idolized heroism of the battle-field, and to the so much sought after greatness which wealth, and rank, and titles, and learning, bestow in this world. And reflect, dear Sir, that the true Christian's principle of faith within him increases in its power to bless him in proportion to the desolateness and severity of his external condition. This grand principle within him, I say, becomes most powerful to comfort him when he is most destitute of aid from external circumstances. Surely, Sir, you must see its divine origin in its nature; that it is from God. A sublime instance of this Christian triumph now recurs to my mind, as related by my friend the Rev. John Simpson, and called "*The contrast*," in his interesting little work "*Smiles and Tears*," published by Ward & Co.

Touching the great subject of this letter, the *organic vitality*, and the influence which mental causes have on it, it is well known to the intelligent practitioner, and is correctly inculcated by the best medical writers, that the patient must have confidence in his medical adviser in order to be benefited by his treatment. A rather extensive field of inquiry would open

out to us on this point had I space to devote to it. It is not only concerned in legitimate and scientific practice of the healing art, of whatever mode of treatment, but extends to empirical practice, as the chief agent for any good effect it may occasionally produce. There are many kinds of it, but I will not name them. The imagination becomes the chief medium of cure in such practice; and truly astonishing have been the successful results in certain and special cases. But I must let this brief allusion suffice, because of my limited space. You know that in writing these letters for publication I keep ever before my mind, in order to avoid it, "*mega biblion mega kakon*" — *a great book a great evil*.

You must understand that the confidence of the patient in the knowledge and skill of his physician, becomes a point of vital import in the treatment of disease, and especially of certain ones which more deeply implicate the nervous systems. I need not again assure you that the *vis medicatrix naturee*, or organic vitality, is greatly influenced by it. Medical writers on therapeutics have very properly taken special notice of it, knowing so well its importance.

It is a matter of history in the military exploits of Napoleon Bonaparte, that the justly celebrated Baron Larry, his chief military surgeon, became an almost indispensable person to accompany him; so unbounded was the confidence of the whole army in that great surgeon's skill and energy of character, and so successful was his practice. Indeed, I can readily suppose how great would be the mental influence of the Baron Larry on the minds of the susceptible and sentimental soldiers of Napoleon.

I now, even, look back with pleasing recollection on the time of my attendance at the military hospital near Paris, when Baron Larry was there, the surgeon in chief. His skill and experience were of the highest order. His real kindness of heart and his paternal bearing towards the sick or wounded soldiers were remarkable. His personal appearance, too, was prepossessing, with his long dark locks flowing over his shoulders, and every feature of his benign countenance bespeaking

his affectionate desire to benefit his patients. He was all energy and care for their welfare.

No wonder, when the army embarked for foreign service, that the soldiers contended for the privilege of carrying Larry shoulder-height to the boat; and that, amid the acclamations of thousands of warriors, they shouted aloud that they now cared not for swords, and bullets, and cannon balls, for they had got Larry to attend on them! When in active service in the camp he was beloved by the whole hosts of France. Napoleon valued him most highly, and always gave a ready ear to his instructions or complaints touching the rations of the soldiers, and other matters connected with the duties of the commissary. Baron Larry was mentally and physically endowed for the position he occupied, and was of incalculable value to Napoleon Bonaparte.

## LETTER X.

NOSTALGIA AND SLAVERY—MESMERISM AND CASE OF W. JONES—VARIOUS SYSTEMS OF TREATMENT—DESERVED PRE-EMINENCE OF THE GREAT WATER CURE—ALLOPATHIC REMEDIES EFFECTIVE BUT INJURIOUS—HOMOEOPATHY SUPERIOR—MESMERISM—KINESIPATHY—HUNGER CURE—GRAPE CURE—OXYGEN GAS—GOVERNMENT PATENT QUACKERY—CONCLUSION.

MY DEAR SIR,

ILLUSTRATING our doctrine of mental influences on the vital force, or curative power, it is well known how much more liable to suffer from disease is an army defeated and retreating than is one marching in victory. How correctly concatenated are the three giant evils which the madness of men brings on them—war, pestilence, and famine! Also in civil life, we know how unfavourable becomes adversity of any kind to those who are exposed to infection, or are suffering under disease. The history of malignant cholera tells abundantly of this.

The marked influence of mental causes, and especially of the predisposing power of fear, has been often experienced in our country. These causes depress the organic vitality, and thus they incapacitate it for its office of protecting or rescuing the body from the disease.

The disease, if it can be truly so called, technically termed *nostalgia*, and defined "*a vehement desire for return to home and country*," furnishes abundant evidence of the influence of mental causes on the organic vitality. This is seen amongst those of the wronged race of Africa, who have been torn from home with all its charms of the silver-toned names of father, mother, sister, brother, wife, and children; torn from all these by the civilized white man! This *nostalgia* affords a striking illustration of our subject of the mental causes of disease and death. Thousands, and tens of thousands, of those oppressed Africans become the easy victims of disease induced by the depression of *vital power*.

Oh, Sir, how are we to refrain from sorrow and shame for human nature, when we reflect on this accursed man-traffic! What ought to be our feelings of indignation on thinking of the sighs, and tears, and tortures, and death, caused by man to his fellow-man in this horrid affair of slavery! But I must not pursue the subject. It is, indeed, fraught with dreadful things. Let us pass it with a groan for the cruel cupidity of civilized man, and with earnest prayerful sympathy for his suffering victims—his fellow-men, the African negroes!

From what I have now laid before you on the nature and causes of disease, you must perceive that any means of treatment, to be really *remedial* or *curative*, must tend directly or indirectly to restore the organic nervous energy or curative force, or to favour its action, or to preserve its vigour: that such will enable it to resist the influence of morbid agents, and to rescue the body from their effects in disease.

Dr A. T. Thompson, Professor of Materia Medica and Therapeutics in the University of London, states in his *Elements*—“That every medicine operating on the living solid exerts its influence either directly or indirectly upon the nervous system can scarcely be denied. \* \* It is not essential,” says he, “we

should be able to demonstrate *in what manner* this communication with the distant parts of the body is effected by the nerves. It is enough for us to know that those substances, which are comprehended under the term *vital agents*, produce their effects *by influencing the nervous energy*—that power inherent in the brain, the *medulla spinalis*, and the nervous system generally, by which not only all the vital actions are maintained, but through which also we are willing, moving, and conscious beings.”

We see that the brain and nerves are readily affected by mental influences, and by the application of medicines. As stated by Dr Thompson, we do not know in *what manner* this communication with the distant parts of the body is effected by the nerves: neither do we know why certain medicines and mental feelings should affect certain organs instead of others. We know the fact by experience.

As stated by Mr Neilson in his work on mesmérism, “another mode of stimulating the brain force to sufficient action, and regulating its flow on the nervous system, is found in the mesmeric process. And whilst there is much here also of which we are quite ignorant, although that the mesmeric process should possess such power is not so contrary to *a priori* reasoning as that drugs should—it is enough that we have experience of the fact, although we cannot assign the reason.”

Again. “If doctors cannot understand how the health-force or motive power of a man’s brain is communicated to his own nervous system, so as to regulate the working of his organic functions, it is utterly absurd in them to condemn mesmerism merely because they cannot understand how the health-force of a man’s brain is communicated to the nervous system of another. In either case the fact does not depend on their comprehension. The question at issue is not about them at all, but about the mesmeric process. Does it convey such a curative force? Experience, the sole interpreter of such truths, has fully proved that it does.”

You may be sure, dear Sir, that the fact of *mesmeric curative power* is indelibly impressed on my mind by my experience in the remarkable case of amputation of the leg whilst the patient was

under the mesmeric sleep, and which I described to you at length in one of my former and unpublished letters on mesmerism in connection with water treatment. You remember that, decisive as was the case, in proving the great value of mesmerism as an *anæsthetic power*, that is, to prevent all feeling of pain, unexpectedly it became still more satisfactory to my mind, in also demonstrating its great *curative power*.

You remember, that on our examination of the stump of the amputated leg two days after the operation, we discovered, to my sore disappointment, that it was in a very unhealthy state, and that no healing process whatever had taken place, because of the low state of vital force in the constitution of William Jones, on whom I had operated. As I stated before to you, I had previously and fortunately discovered that I possessed an extraordinary mesmeric influence over him; even more than did the very powerful man who mesmerised him for the amputation. Knowing this, I immediately commenced to exercise my power *in great earnestness of mind*. I kept Jones much under my mesmeric influence, and was particularly careful to mesmerise the unhealthy stump, by making passes on it frequently during the day. In a few hours it positively assumed a healthy appearance; and in a day or two more its perfect adhesion had taken place. It was rapidly healed, and the life of Jones was rescued from impending death: for, no doubt, he would have soon died; and nothing that I know of, besides mesmerism, could have saved him.

Now, apart from my other experience and knowledge of cases cured or benefited by mesmerism, this one case alone has set my mind at rest respecting its *curative power*—its great efficacy as a remedy. You may readily suppose that after this my experience of the fact, my confidence will never be affected by all the unreasonable outcry of its opponents.

I must not forget to state, that in exercising the powerful mesmeric influence which I possessed over Jones, I frequently had him in the clairvoyant state, and exhibited different manifestations to persons wishful to see them. I could bring any individual cerebral organ into immediate action by placing my



finger upon it whilst he was in the mesmeric state. For the conviction of some disbelievers in the science, I caused his eyes to be most effectually secured by bandages and other means, against any possible use of the *natural sense of sight*: I then brought into play his *mesmeric* or *magnetic vision*, and it was certainly most decisive. I need not particularize; only it must be stated, that he seemed to possess this power of mesmeric perception or sight in his *finger-ends*. He continually directed his extended fingers towards any object of which he was desired to speak; and whenever he appeared at all uncertain as to the nature or reality of an object, he complained to me of his want of light in his fingers; on this, I always told him to let me mend them, and I then made mesmeric passes on his hands, and he seemed to gain magnetic visional power by the process.

It is certain that the nerves conduct the brain influence: it matters not how they receive it, nor what may be the original cause of its existence. As stated by Dr Esdaile, whose extraordinary surgical operations under mesmeric sleep, and whose scientific investigations on the subject, in the East Indies, entitle him to the highest commendation, "when one person is made the exclusive object of another's attention for a certain length of time, surprising effects have ensued, which are now called *mesmeric phenomena*" \* \* \* \*

We can assign no reason why the nerves should not accept will-impelled nervous matter as well from one extremity—as readily from the cuticular as from the cerebral terminations of the nerves."

We come, then, to the conclusion, that by various modes, although in different degrees, the curative nervous power may be favoured or brought into action, directly or indirectly,—by mental influence—by medicines—by the mesmeric process—and above all, by water treatment. There are also other effective modes for the purpose, belonging to other systems of cure: and that they can effect the desired result has been proved by experience.

I feel confident, dear Sir, that at this stage of our correspondence I need not waste words in advice that you give no ear to

the very unreasonable outcry so often made against the Water Cure, and Mesmerism, and Homœopathy, and, indeed, against all methods of cure but that of the old beaten path of Allopathic drug medication, which has now been trodden some thousands of years.

Allow me, in sincere affection, to counsel you to cling to truth wherever and whenever you recognise it. Let not your adherence be affected by the opposition of any opponents. Be truth your bulwark, and be not moved from it. Always, in the severest trials of your allegiance, adopt the resolute sentiment contained in the language of him who, in a different cause, was asked if he was not moved. He replied—

“Yes, as rocks are  
When foamy billows split themselves against  
Their flinty ribs; or as the moon is moved  
When wolves, with hunger pined, howl at her brightness.”

To return. You now understand that all external influences which give rise to disease in the human body, must have their primary action upon the nerves. The most usual, and secondary, and ostensible effects are upon the organs of digestion, blood-making, blood circulation, and nutrition. We have to direct our means of cure principally in relation to these functions, keeping ever in view the *organic nervous energy*. You must recollect that the nature of such ostensible effects is known to consist in disease and disorder of the stomach, liver, and bowels; in the deterioration of the quality of the blood, and especially in its unequal distribution in its capillary vessels. Its quantity of excess or of deficiency must likewise be considered as the result of causes whose operation is on these functions. However, in the preceding letters these points have been explained to you, and I beg of you to consider their importance.

You remember what I advanced in my other treatise, on the operation of the remedial measures of the Water Cure, and particularly on the prominent part which the oxygen of the atmospheric air always plays in the waste and repair of the human body—in the change of tissue; in diseases, and in the means

of cure. You will also remember the very important relation which pure water holds to the well-being of the human system ; and what an efficient means it becomes in the hands of the skilful practitioner of the Water Cure. You remember how efficient, because *natural*, are all the means and appliances of that fundamental system of treatment.

In this letter I have given you a sketch of the real power which cures or heals in the treatment of all diseases. Much more might have been advanced in explanation of its nature and mode of action ; but I think that you have here a sufficient account to give you a correct idea of the mode of operation of all remedies. You can now form a reasonable judgment of therapeutics, or cure, which have been adopted in this country. Surely, you now concur with me in my very high opinion of the superior efficacy of the Water Cure, when it is skilfully administered. You can now comprehend the statements of so many cases on record of the severest diseases cured by water treatment, after the failure of other modes by their most skilful practitioners.

Again, you can now see the absurdity of the exclusive adoption and advocacy of any one system of treatment, with the wholesale and angry condemnation of all others, as has been too much the fashion with many half-informed practitioners of Allopathic drug medication. You must perceive, however, how limited must be the ground for successful practice of such men, compared with the position of that practitioner who practises on the great and fundamental principles herein laid down. His mental eye being ever fixed on these principles, he will not be fettered by conventional rules, but will gladly avail himself of all remedial means which he knows to be suitable for his purpose,—the restoration of his patient.

You are wise in your determination to learn what you can of these very important subjects, as expressed in your last letter to me ; and rest assured that I have much pleasure in teaching you scientific truth. Depend upon it, the principles and practice which are inculcated in these letters, as well as what is also taught in the small treatise "*On the Nature of*

*the Water Cure*," will stand the test of the most rigid scrutiny, and will pass the ordeal of any future experience.

From this sketch, concerning the real power which cures in the treatment of diseases, you may form, I repeat, a correct opinion of the different systems of therapeutics. It is my honest conviction that Allopathic medicines and remedial measures, judiciously selected and carefully administered, have proved effective remedies; although much injury has also been frequently done by them. During many years have I seen valuable lives rescued by them from impending death. But I am now as thoroughly convinced by facts and experience, some of which I have stated to you, that the administration of medicines on the Homœopathic principle is in many respects far superior. As said before, it is more effective in the treatment of disease, because it does not injure the animal frame, nor interfere with its *innate curative force*.

Again, you understand that in Mesmerism or Animal Magnetism we possess an invaluable power over the nervous systems of man. Under certain circumstances, and in many cases of disease, it becomes a curative means which no other can supersede, and for which we possess no substitute. This I have known in repeated instances; and it is continually demonstrated at the Mesmeric Hospital in London, over which Dr Elliotson presides. As an *anæsthetic power*, that is, for procuring an entire deprivation of feeling during surgical operations, it is by far the best we know of, much safer and better than chloroform. But we cannot always so easily procure it. I have already informed you that I have had experience of both of them in surgical operations.

There is also the system of *Kinesipathy* (derived from the Greek *Kinesis*, movement, and *pathos*, a disease), which is Ling's system of gymnastics, or therapeutic movements, of which there is an institution at Stockholm large enough to contain 500 patients. Many extraordinary cases of cure have been recorded in the annual reports.

I see by an advertisement in the *Times* newspaper, that there is also an institution of this kind, in conjunction with the Rus-

sian Bath, in Old Cavendish Street, London: and one also at Marlborough Place, Brighton; both belong to, and are superintended by, Dr Roth. And three different books on the subject have been published by him. I may also inform you, that this system of gymnastics is now much practised at Hydropathic Establishments, as an auxiliary means of treatment; and much benefit is frequently derived from it.

You can now, too, judge of the other systems which are more extensively practised on the continent—the Hunger Cure, and the Grape Cure, of the German and French physicians. There are other curative means besides, which become occasionally of the greatest value, when in the hands of skilful and intelligent practitioners, who are unprejudiced and unfettered in mind. Their minds are guided by the light of science and experience, and are especially intent on benefiting the afflicted of mankind. The medical practitioner, who is worthy of the name, must not be shackled with the spirit of party, nor by the puny authority of names and systems. Of the curative means I allude to, I mention Galvanism and Electricity; also the inhalation of oxygen gas. The former, you at once perceive, will act more particularly on the nervous system; the latter, more directly on the blood. Very striking cases of disease have been recorded, in which these means have been used with the best results. With your present acquirement of valuable physiological knowledge, you can readily believe the record of their remedial power.

And I trust that you now see the reasonableness of the great rule of therapeutics, or cure, which is also that of common sense—that the means of treatment must always be adapted to the nature of the disease, and to the many and various conditions of the patient. I mean those which relate to his bodily and mental constitution, his temperament, his age, his habits of life, and indeed to all the things which unite to constitute the case of the individual. Hence you can readily concur with me in the doctrine I have inculcated throughout these pages—that no single or exclusive mode of cure can always and fully meet every case of disease. That system of treatment which can

meet the largest proportion of cases, with all their modifying peculiarities, is most justly entitled to preëminence as the *fundamental system*. It is my conviction that such preëminence belongs to the great Water Cure; and that the other modes of treatment become auxiliary means, whenever the genuine Water Cure is available, as at Hydropathic Establishments.

But there is yet another system, or mode of treatment of diseases, which I must not pass entirely in silence. It is much too prevalent in our own intellectual and scientific England. I mean *Government-Patent Quackery—the mode of treatment by patent medicines*. You are now prepared to judge of its entire value; and of those who practise it, and prey upon the ignorance and gullibility of Englishmen. You can now duly appreciate the pretensions of advertising patent quacks, who profess to possess in pills, and potions, and balsams, and compounds of incomprehensible names, the infallible remedies of all diseases! But I really cannot summon patience enough to entertain the subject to much greater length. You now know that there cannot be the least connection between such pretensions and any true principle of treating the diseases of the human frame.

I recollect that you have questioned me in one of your letters, respecting the occasional efficacy of those patent medicines. I think you mentioned a case of cure in a young man who took, for one month, a certain well-known and advertised pill. I quite believe you, and understand the thing, and so may you, on a little consideration. You may suppose a case of disease, in which there might be great sluggishness of the functions of the internal organs, and more especially of the bowels, and thereby also of much suffering and incapacity for the duties of life. And, mark me, this obstruction might constitute, in the case of a young man, the principal clog or burden to oppress the *vital force*, or *organic nervous energy*. The violent operation of any purgative pill might be so far of use, and opportune, in removing that clog and burden to the internal functions, and particularly of the bowels, on which so much depends. The purgative stimulation might, no doubt, prove beneficial for the occasion,

although highly injurious to the organs so stimulated. No doubt, there have been instances of early relief procured by such means; without doubt, also, by the same means continued, many individuals have been hurried to the grave!

I here apprise you that the continued operation of purgative medicines will effect great changes in the human body, as was long since inculcated by Dr Hamilton, of Edinburgh. Keep in mind, however, that such operation is frequently highly injurious. The old fashion of extreme purgation of the bowels, which Dr Hamilton's book did much to establish amongst medical practitioners, has been long exploded as fraught with evil of very serious kind; the consequences of treatment being frequently worse than the disease which may have been removed.

Let me inform you, that the government patent mode of treatment is by no means confined to the use of purgative drugs. I believe that almost every drug of the *materia medica* has been a component of patent medicines: those of chief note, however, are the most powerful *specifics*, as they have been called. I allude to the class of drugs which are of a most violent and poisonous nature, and which are usually administered with the greatest caution by the educated practitioner of drug medication, and only against certain diseases. Of these are mercury, arsenic, iodine, antimony and opium, &c., &c.

The uneducated and unskilful, but fearless charlatan, or quack, having knowledge of the great power of such drugs in other hands, makes use of them on his own haphazard and dangerous system of *kill or cure*. Thus, for all kinds and degrees of *venereal diseases* you will be sure to find some most virulent preparation of *mercury in his certain cures* for them; but under the name of *vegetable specific*, or something of the kind, with a lie in the face of it. Again, for *gout*, you will find a powerful preparation of *colchicum*, the most hackneyed means made use of against that disease and *rheumatism*;—and so on, for other complaints.

But I feel assured that I need not say more to you on this topic now, at the conclusion of our correspondence on the true

philosophy of health and disease. The whole affair of *patent medicines* may be properly classed amongst the many evils of this world of which the love of money is the root.

The patent system will continue to prosper in this country until the public mind become better instructed on the great subjects of human physiology, and the true principles of therapeutics. This will yet take place; for it is not a difficult thing, and already there is great improvement in comparison with past years. The press, the giant power of civilization, liberty, knowledge, and truth, will accomplish this.

#### CONCLUSION.

Now, my dear Sir, we must conclude our present correspondence. In treating of the subjects of these letters I have been repeatedly tempted to transgress the limits I previously laid down for my little volume, so closely associated have I found many collateral particulars. The one most closely and prominently associated is that of the infinite wisdom and the benignity of design of the adorable Creator, by whom "we are fearfully and wonderfully made."

There is something in association with these Divine attributes and the disease and suffering of the human body, which I would have you devoutly to consider. And I would guard you against a philosophy, falsely so called, which has been put forth by certain authors, who write of disease as always an unmixed evil, and the invariable penalty attached to man's disobedience to the laws of their goddess *nature*: again, that the perfect exemption of mankind from disease and suffering would be an unmixed good, and the conversion of our earth into a kind of Paradise. Furthermore, that health and animal vigour, as well as mental purity and power, would be as invariably the reward of perfect obedience to the laws of health. No doubt there is a *prima facie* degree of truth in some of these statements, and a correctness to a certain extent.

But much vain moralizing and specious intellectual speculation have proceeded from such exclusive notions and limited



views of disease and suffering. Beneath the superficial fact of their ostensible causes, existence, and continuance in our world, there remains the solid rock of Divine truth respecting them—that they belong to the consequences of “*man's first disobedience* ; ”—and that their continuance in the present state of our world is for the accomplishment of certain purposes in the moral government of God. I am aware that I am now treading on the threshold of an extensive and disputed subject, on which many volumes have been written. However, I shall keep off it, beyond an observation or two bearing directly and only on the subject-matter of these letters.

The false philosophy to which I have just alluded, is without any sanction from the authority of the sacred writings, where alone we find sure ground to rest on. With all our reasoning on the nature of *good* and *evil*, we find it difficult to correctly define what really constitutes either the one or the other in our present state of existence, except what in the infallible and inspired volume are termed *sin* and *holiness*. Of the things of our earthly career we find, by our past experience, how often we have erred in our estimation of what we considered *good* and what *evil* in respect of ourselves.

To go not beyond the principal subjects of these letters—disease and suffering, on mature reflection on their associations we find at once great cause to doubt that their entire banishment from our present world would be really productive of unmixed good. In truth, they form a part of it : and by such a removal we should be deprived of a frequent source of our purest pleasures. The chamber of sickness is the place where many of the kindest sympathies and the purest charities of man, like lovely flowers in a congenial soil, germinate and bloom ; and which, without it, would not have exercise or existence. What scenes of human nature, in its noblest and holiest aspects, have been acted *there* ! What faithful affection and self-denial ! What reciprocal feeling of kindness, and love, and gratitude, between the occupiers and the attendants of the sick-room ! Ah yes, in this school of human nature, where sickness and suffering become the great teachers, the best exercise is given of the finer

feelings of the human heart. It is *there* that the sincere attachment of the beloved wife is displayed in its most endearing character; and *there* is cherished the purest conjugal love. *There* it is that the anxious and tender mother is seen in the most attractive beauty and loveliness of her nature, and binds to herself in closer bonds the affection and esteem of her children. And so we might proceed through all the relations of human life.

But a more special and important influence of disease and suffering has a bearing on the individual afflicted. How truly is sickness a blessing in disguise! We have constant need of a counterpoise to the ceaseless influences within and without us, to keep us awake to a due sense of the shortness and uncertainty of life. How significant and true is the often-quoted line of Young's most impressive poem—" *All men think all men mortal but themselves!* " How willing are we all to push from ourselves the thought of our liability *to die at any moment!* Yet sickness and suffering sternly teach us that truth; and it is surely in mercy and goodness! But let us regard the grand purpose to be served. To many a rebel heart of man has the sick-room proved the dread but blessed audience-chamber of the Almighty King, where in mercy and grace He has revealed Himself, and held conference with it for the soul's salvation. To the believer in Christ Jesus sickness and suffering become the furnace of affliction, to refine his soul; and, under the chastening hand of the best of fathers, to exercise his dormant grace: or, at death, for the trimming of the lamp, to meet the Bridegroom. But I must conclude. Remember, dear Sir, the so often forgotten truth, that He who is perfectly wise cannot err; and that He who is infinitely good cannot be unkind.

Yours affectionately,

J. HORNER.

Thirsk, 22nd May, 1858.

THE END.

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